



## Sustainable Water Resources Roundtable SWRR

Top of the Town, 1400 N. 14<sup>th</sup> Street, Arlington, VA  
May 30-31, 2012

### Connections on Water Sustainability

# Proceedings

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**Welcome Remarks from SWRR:** David Berry, SWRR manager, welcomed the group to the Top of the Town and the Sustainable Water Resources Roundtable. He introduced SWRR co-chairs, Bob Wilkinson and John Wells.

**Sustainable Water Resources Roundtable Activities and History:** John Wells described the roundtable as a national collaboration of federal, state, local, corporate, non-profit and academic interests, as well as a committee of the USGS Advisory Committee on Water Information. The SWRR mission is to promote sustainability of the nation's resources through evaluation of information, development and use of indicators, targeting of research, and engagement of people and partners.

More than 600 participants from federal, state and local governments; corporations; nonprofits and academia have been engaged in SWRR activities, with meetings in California, Colorado, Maryland, Michigan, Minnesota, Virginia and Washington, D.C. The SWRR website is located at <http://acwi.gov/swrr/index.html>. Two SWRR reports of note are its 2005 Preliminary Report [http://acwi.gov/swrr/Rpt\\_Pubs/prelim\\_rpt/index.html](http://acwi.gov/swrr/Rpt_Pubs/prelim_rpt/index.html) and 2010 SWRR Report [http://acwi.gov/swrr/Rpt\\_Pubs/SWRRReportMarch2010.pdf](http://acwi.gov/swrr/Rpt_Pubs/SWRRReportMarch2010.pdf).

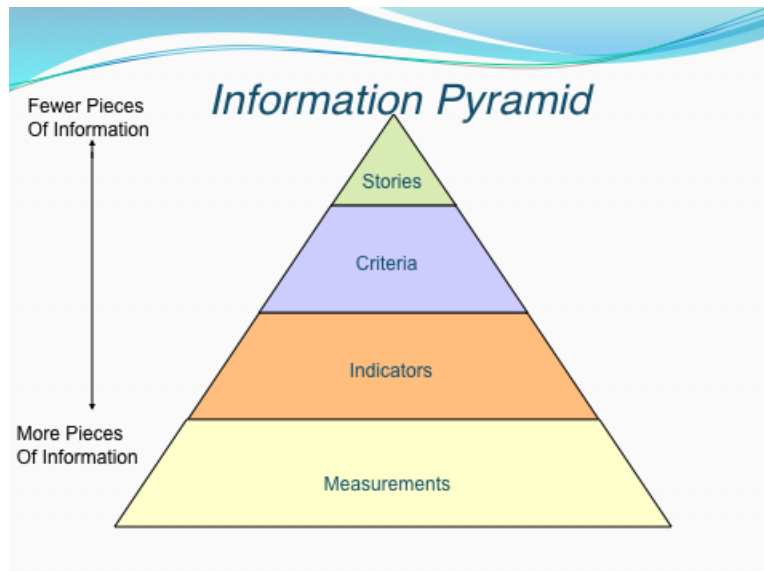
John discussed the roundtable's "view of the world" to give participants a sense of the intellectual foundation from which the SWRR does its work. He showed the group the "eye" diagram of essential relationships of sustainability with fisheries. The three parts of the eye include the economic system, a subset of the social system, which is in turn a subset of the ecosystem.

In the case of fisheries, the SWRR refers to the ecosystem of interest as aquatic and related ecosystems – with "related" intended to capture the terrestrial ecosystem elements that affect the aquatic system. The social system includes governmental, tribal and traditional arrangements for managing fishing, and the communities that fishing supports. The economic system includes fishing equipment, labor and market processes for fishing.

Another way the roundtable looks at the world is through the concept of capital. Capital is the capacity to produce value over time. Environmental, social and economic systems produce value through flows of services, experiences, or goods that meet human and ecosystem needs over time. We achieve sustainability by maintaining capital to meet needs.

The processes responsible for natural capital include: disturbance and response, energy cycling, hydrologic cycle and flow regime, and materials cycling. Social and economic drivers that take advantage of natural capital and produce social and economic capital of their own include: economic development, energy production and use, land use, population growth, and transportation.

The figure represents these forms of "capital" as criteria, which form the basis for indicators of environmental, social and economic well being, and the stories people need to hear about how the environment and society are doing.



The roundtable defines indicators as measures that present trends information relevant to water sustainability in a readily understandable way. The factors that it believes important in a good indicator are: condition and capacity of ecological, social and economic systems; a focus on what's most relevant to sustainability; appropriate time horizons and scale; information integrity, and understandability.

The California Water Plan, Blueprint for Integrated Water Management and Sustainability, provides a good example of the role of sustainability indicators in safeguarding water resources. According to Rich Juricich of the California Department of Water, the entire system – from water and flood facilities to watersheds and ecosystems – has lost resilience and is changing in undesirable ways.

There is an imperative to act to keep pace with a range of changes, from population growth and movement to the shift in permanent crops, increasing flood risk, declining Delta and watersheds, impaired water bodies, climate change profoundly impacting water systems, aging water and flood systems challenged by legal remedies and regulatory protections, to the growing economic and societal consequences of declining water reliability and degraded quality of surface and groundwater supplies.

These stories are told by the system of indicators employed in the California Water Plan. Each sustainability objective in the plan is paired with a set of indicators. For example, the sustainability objective of improving water supply reliability is paired with indicators tracking energy required per unit of clean drinking water, average water use per capita with a 20% reduction expected by 2020, and sufficiency of flows and timing for maintaining historically present native aquatic fauna.

In fact, the California Water Plan Update 2013 includes the explicit water sustainability indicators objective of helping monitor progress through the development and application of an

analysis framework. Indicators and indices, data and data analysis, performance evaluation, and the publication of report cards are key elements of this framework. The purposes are to understand the status of and trends in the condition of California's water resources and associated management effectiveness.

The goal of California's indicator framework is to educate the public and program managers, alike, ultimately to improve protection and management of the state's water resources, whether by changing state efforts or public behaviors.

The next steps for the SWRR include continuing outreach; building regional connections; adding new private, nonprofit and public sector partners; refining the roundtable's sample indicators; addressing sustainability and scale; linking to national and regional indicator sets; collaborating with the National Water Census and other indicator initiatives across the nation; and assisting agencies in describing the need for programs to collect indicator information.

More Information is available at <http://acwi.gov/swrr>

**Round of BRIEF Self-Introductions:** Participants introduced themselves to the group, mentioning their interest in sustainability and water. The introductions revealed a group with a vast range of experiences and expertise, and generally, an overriding interest in and deep concern for water.

## **Introducing the Advisory Committee on Water Information (ACWI) and its Subgroups:** John Wells, moderator

### **ACWI**

Wendy Norton, ACWI Executive Secretary, provided an overview of the forum. Key ACWI contacts include the Assistant Secretary for Water and Science U.S. Department of the Interior, Anne Castle, ACWI Chair; William Werkheiser, ACWI Alternate Chair and Associate Director for Water, USGS; and Wendy who serves as chief of the Water Information Coordination Program of USGS.

The U.S. Department of the Interior, through the U.S. Geological Survey's Water Resources Division, is responsible for the Water Information Coordination Program of the Federal Government. The responsibility for water data coordination was delegated to Interior in Office of Management and Budget (OMB) Circular A-67, "Coordination of Federal activities in the acquisition of certain water data." In 1992, OMB Memorandum 92-01 replaced and updated Circular A-67, an action which: a) combined two advisory groups into the Advisory Committee on Water Information to increase the possibility of meaningful dialogue between the federal and non-federal sectors; and b) created the USGS Water Information Coordination Program.

ACWI's federal members include the U.S. Department of the Interior, Geological Survey; U.S. Environmental Protection Agency; U.S. Department of Agriculture; National Oceanic and Atmospheric Administration, National Weather Service; U.S. Army Corps of Engineers; and Tennessee Valley Authority.

ACWI's state and county members include the Association of American State Geologists, Association of State Flood Plain Managers, National Association of Clean Water Agencies, Western States Water Council, Association of State Drinking Water Administrators, Association of Clean Water Administrators (formerly ASIWPCA), Interstate Council on Water Policy, and National Association of County Planners.

ACWI's "other interests" members include the American Water Resources Association, American Water Works Association, League of Women Voters of the United States, National Council for Air and Stream Improvement, Inc., National Ground Water Association; The Universities Council on Water Resources, American Society of Civil Engineers, Electric Power Research Institute, Ground Water Protection Council, North American Lake Management Society, and Water Environment Federation.

Subgroups of the Advisory Committee on Water Information include the National Water Quality Monitoring Council, National Liaison Committee for NAWQA, Subcommittee on Spatial Water Data, Subcommittee on Hydrology, Subcommittee on Sedimentation, Methods and Data Comparability Board, Subcommittee on Ground Water, and Sustainable Water Resources Roundtable.

The National Water Quality Monitoring Council provides a national forum for coordination of consistent and scientifically defensible methods and strategies to improve water quality monitoring, assessment and reporting. The Council also promotes partnerships to foster collaboration, advance science, and improve management within all elements of the water quality monitoring community.

The Methods and Data Comparability Board provides a forum for exploring, evaluating, and promoting methods that facilitate collaboration and further comparability between water monitoring programs.

The National Liaison Committee for the USGS National Water-Quality Assessment Program creates an ongoing national liaison process for external organizations to work interactively with the NAWQA Program in joint problem solving on water quality issues.

The goal of the Subcommittee on Ground Water is to develop and encourage implementation of a nation- wide, long-term ground water quantity and quality monitoring framework that would provide information necessary for the planning, management, and development of ground water supplies to meet current and future water needs and ecosystem requirements.

The Subcommittee on Hydrology strives to improve the availability and reliability of surface-water quantity information needed for hazard mitigation, water supply and demand management, and environmental protection.

The Subcommittee on Sedimentation promotes and supports development and standardization of equipment, methodologies, and calibration and performance criteria for the collection, analysis, interpretation, and interchange of fluvial- sediment data and related technical information.

The Subcommittee on Spatial Water Data (sponsored jointly with the Federal Geographic Data Committee) develops water- resources components of the National Spatial Data Infrastructure.

The Sustainable Water Resources Roundtable serves as a forum to share information and perspectives that will promote better decision-making regarding the sustainable development of our Nation's water resources.

During the past 2 years, ACWI has been formally asked to review and comment on:

- The implementation plan for Interior's WaterSmart Initiative
- A report from NSTC's Subcommittee on Water Availability and Quality written in response to the SECURE Water Act
- The USGS Strategic Science Planning process

In addition, earlier in FY 2012, volunteers from ACWI convened to discuss the formation of an ad hoc workgroup to address water issues related to climate change. This is in response to recommendations made in two documents: a) the Interagency Climate Change Adaptation Task Force's National Action Plan, and b) a report from NSTC's Subcommittee on Water Availability and Quality regarding Section 9506 of the SECURE Water Act (as contained in the Omnibus Public Lands Act, P.L.111–11). The first tasks for the workgroup include identifying co-chairs, drafting a workgroup mission statement, and considering how the workgroup can support implementation of the Interagency Climate Change Adaptation Task Force's National Action Plan.

The annual ACWI budget has declined from a high in 1992 of about \$2 million to between \$700,000 and \$800,000 today. Still, the forum and its subgroups are seen as cost-effective vehicles for coordinating water information activities.

More information is available at <http://acwi.gov>

### **National Water Quality Monitoring Council:** Susan Holdsworth; EPA

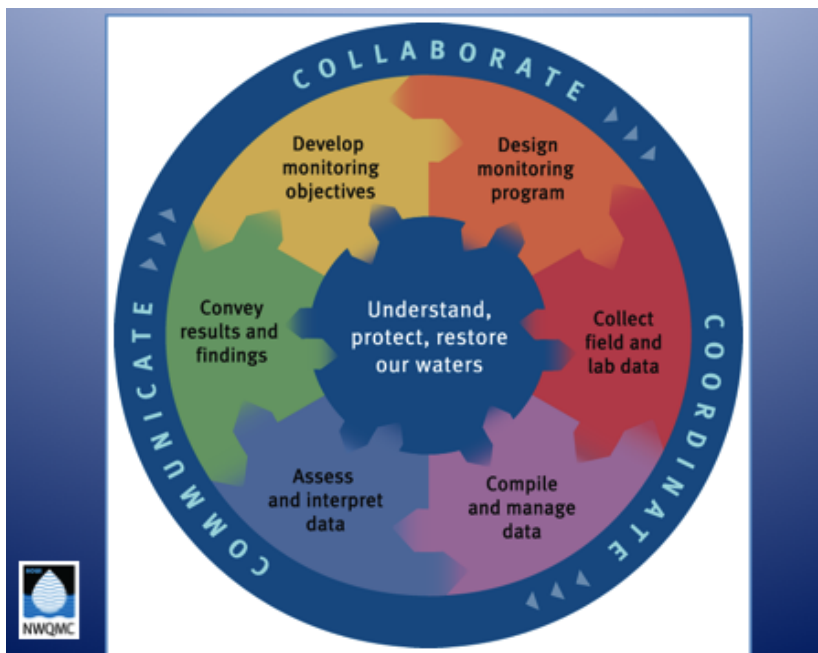
Susan Holdsworth next gave an introduction to the National Water Quality Monitoring Council. The council was created by ACWI in 1997 and is co-chaired by USGS and US EPA. It provides a national forum for coordination of comparable and scientifically defensible methods and strategies to improve water quality monitoring, assessment and reporting. The council promotes partnerships to foster collaboration, advance the science, and improve management within all elements of the water quality monitoring community. It provides a voice for monitoring practitioners across the nation and fosters increased understanding and stewardship of our water resources.

The council's membership is about 30% federal, 70% state, NGO, and academic, etc. Federal members include representatives of EPA, USGS, NOAA, US Forest Service, US National Park Service, US Department of Agriculture, and the US Army Corps of Engineers. Nonfederal members include state water quality agencies (by region), the Association of State Geologists, University Water Resource Research Institutes, NALMS, National Science Foundation/CUAHSI, American Society of Limnology and Oceanography, volunteer monitoring, tribal councils, water utilities, Association of Conservation Districts, and Consortia (Gulf of Mexico, Great Lakes).

The figure on the right describes elements of the council's mission to collaborate, coordinate and communicate on efforts to understand, protect and restore the nation's waters

The council is currently working in the following areas:

- Water Data Portal
- Reference Condition
- Methods and Data Comparability Board
- Water Information Strategies
- National Monitoring Network for Coastal Waters
- Communication and Outreach



The council does its work through workgroups. One does not need to be a member of the council to participate on a workgroup.

The water quality portal is intended to help managers more effectively address environmental issues by making monitoring data readily available for analysis. The council reached an important milestone that addresses this issue with the release this week of a single, unified portal available through the council's web page.

The portal is a cooperative service sponsored by the USGS, EPA and the council that integrates publicly available water quality data from the USGS National Water Information System (called NWIS), and the EPA Modern STORET Data Warehouse. Nearly 200 million results from over 5 million monitoring locations are currently accessible through the portal.



Developing a national network of reference (pristine and minimally disturbed) watersheds for freshwater streams is one of the council's newest activities, and one that addresses an issue that is important to many water quality managers. It is also one of the key functions called for in the council's terms of reference.

The council has established an interim executive committee that will develop a blueprint for a collaborative national network of freshwater reference watersheds and monitoring sites. The network will provide quality-assured data and information for use in understanding effects of land use change, water use, atmospheric deposition, and climate change of freshwater ecosystems.

Current activities of the Methods and Data Comparability Board include a sensor workgroup, National Environmental Methods Index (NEMI), and Statistics Tool Box.

New aquatic sensors guides ([www.watersensors.org](http://www.watersensors.org)) include: a) a QA Matrix: checklist for calibration and record keeping, b) a field deployment guide for siting and maintaining sensors and enhancing representativeness and reliability, c) sensors data elements (or metadata) for who, what, why, when, where, and how, and d) a glossary of terms with supporting documentation.

NEMI work includes development of a Web-based source for environmental monitoring methods, with a format that allows for easy comparison and contrast of critical method parameters. Full methods are available for download at [www.nemi.gov](http://www.nemi.gov).

A new Water Quality Statistics and Assessment (WQSA) Workgroup is helping develop the Statistics Tool Box, including an online system with a range of statistical and assessment tools for designing and analyzing monitoring data and identifying appropriate software.

The National Water Quality Monitoring Network for U.S. Coastal Waters and their Tributaries is engaged in developing integrated land-to-sea assessments of San Francisco Bay, Lake Michigan, and Delaware Estuary. Monitoring includes traditional techniques; real-time, continuous monitoring with sensors, and autonomous underwater vehicles (AUVs).

The council is very active in promoting communication across the water quality monitoring community. The council's newsletter is produced in the spring and fall. It presents relevant articles about monitoring programs at all levels across the nation. The council also sponsors and hosts an ongoing program of webinars on a broad range of topics.

The national council currently interacts with more than 17 councils and partnerships across the nation. Potential benefits of monitoring councils and information exchange within and among such councils include: a) membership and operations, b) support and funding, c) monitoring conferences, d) data exchange, e) building partnerships and leveraging resources, and f) building constituencies for water information use in managing water resources.

Finally, volunteer monitoring resources available to interested citizens include a listserv, newsletter (The Volunteer Monitor) and a publications directory.

More information is available at <http://acwi.gov/monitoring>

### **Subcommittee on Ground Water: Bill Cunningham; USGS**

Bill Cunningham, USGS, federal co-chair of the ACWI subcommittee on Ground Water, described the group's purpose: The overall goal is to develop and encourage implementation of a nationwide, long-term ground water quantity and quality monitoring framework that would provide information necessary for the planning, management, and development of ground water supplies to meet current and future water needs, and ecosystem requirements. This national framework for ground water monitoring and collaboration will be developed to assist in assessments of the quantity of U.S. ground-water reserves, as constrained by ground-water quality.

The subcommittee includes members representing the American Society of Civil Engineers, Ground Water Protection Council, Interstate Council on Water Policy, Association of American State Geologists, National Ground Water Association, Texas Commission on Environmental Quality, US Geological Survey, US EPA Headquarters and Region 8, Association of State Drinking Water Administrators, Water Environment Federation, USDA Forest Service, and

Association of State and Interstate Water Pollution Control Administrators. The subcommittee and its work groups include over 70 people from more than 54 organizations. Twenty percent of these are federal employees, 40% are from NGOs and the private sector, 35% are from state and local government, and 6% are from academia.

The subcommittee was established by ACWI in January 2007. Its framework document was approved by ACWI in February 2009 and in December 2009 the subcommittee selected five pilots to examine ground water management information needs. The pilot project reports were completed in January 2011, the same month that the National Ground Water Monitoring Network released its portal. The subcommittee released its pilot synthesis report in September 2011. The framework document revisions are to be completed in the summer of 2012 with formal implementation of the National Ground Water Monitoring Network in 2013.

The design for a collaborative National Ground Water Monitoring Network involves: a) inventoried federal and state monitoring programs, b) guidance for field methods, c) guidance for minimum data, d) elements, standards and management, and e) an implementation plan and recommendations.

The network's design elements include:

- Groundwater monitoring for the principal and major aquifers of the U.S.
- Groundwater levels and quality with the focus on availability
- Priority on wells/springs with long-term data
- Data from willing data providers, including state, federal, tribal and others
- Data available to all without restriction or cost via an Internet portal
- Data provider to remain the authoritative data source (The network is not to be a "master database.")

The pilot studies covered aquifers in New Jersey, Indiana and Illinois, Minnesota, Texas and Montana. Each study was to evaluate the network within the concepts in "Framework for a Nationwide Ground Water Monitoring Network," including selecting aquifers in which to assess well characteristics, frequency, analytes, "tagging" and spatial distribution. The pilots also were to evaluate field practices, data elements stored in their ground water database, and data management procedures and their documentation; identify network gaps; evaluate ability to transmit data to the data portal; and identify all costs of potential participation in the national network.

Conclusions of the pilot program, first of all, were that a collaborative NGWMN is feasible. Pilot states record data differently and use different database platforms, but most "minimum data elements" are available. Incremental costs of incorporating data from existing state monitoring systems are low. Existing monitoring will not fill all data gaps. The network's Internet data portal is a key element to its success.

Hub components include: a) a Web portal to provide mapping interface to display and search wells, b) a well registry to harvest metadata to power web portal searching and intelligent

parceling of search to nodes, and c) a data mediator to collect data from each node and mediate independent formats to common ones.

Next steps for implementation of the National Ground Water Monitoring Network are for the subcommittee to complete "Framework" updates, solicit additional volunteer (state) data providers, and advise new states on approach. USGS will incorporate USGS water level and water quality data, begin transition from the pilot Internet portal to the national network production portal, and provide assistance to additional state volunteer data providers.

Implementation in future years includes activities identified in Public Law 111-11, including overall management of the network, completing the transition from pilot-scale to a production-scale network portal, continuing implementation with ground water levels and ground water quality data from all interested state data providers, establishing a national program board of data providers to provide network advice/guidance, and providing assistance to data providers.

More information is available at <http://acwi.govsogw>

### **Subcommittee on Hydrology** Richard Raione; Nuclear Regulatory Commission

Richard Raione presented information about the ACWI Subcommittee on Hydrology, which he chairs. The overarching goal of the subcommittee is to improve the availability and reliability of information needed for hazard mitigation, water supply and water use management, and environmental protection. Precipitation and stream flow information are required to support water supply planning, water allocation, flood control operations, water quality management, navigation, recreation, flood forecasting, emergency management operations, and other decision making at local, state, tribal, interstate and national scales.

The subcommittee's purpose is to analyze relevant issues and facts and to draft proposed position papers or recommendations for improving the availability and reliability of surface-water quantity information. The subcommittee forwards the draft papers and recommendations to the ACWI for deliberation and approval as advice to the Federal Government.

The subcommittee considers all quantity aspects of the surface water component of the hydrologic cycle, including precipitation, stream flow, lake and reservoir storage and estuaries. It also recognizes the relationships of surface water quantity to other components of the hydrologic cycle and to the institutional aspects of water resources management. The subcommittee considers policies, programs and activities for the collection, analysis, assessment, archiving, distribution, reporting and use of precipitation, stream flow and related information.

The subcommittee's roots extend back to the Federal Inter-Agency River Basin Committee in 1945 and in the 1960s and 1970s, the development of flood frequency guidelines under the auspices of the Water Resources Council. The WRC Hydrology Committee, composed of federal employees, produced Bulletin 15 in 1967, Bulletin 17 in 1976, Bulletin 17A in 1977 and Bulletin 17B in 1981.

Bulletin 17B was republished in March 1982 under the auspices of the Interagency Advisory Committee on Water Data. The authorization for IACWD (federal) and ACWDPU (public sector) was continued in 1992 under OMB M-92-01. The IACWD and ACWDPU were combined into the Advisory Committee on Water Information in 1996 to comprise of both federal agencies and the public.

The subcommittee's membership includes over 20 federal and non-federal organizations: U.S. Department of Interior: BLM, BOR, OSM, USGS; U.S. Environmental Protection Agency; Federal Energy Regulatory Commission; U.S. Nuclear Regulatory Commission; U.S. Department of Transportation, Federal Highway Administration; U.S. DHS, Federal Emergency Management Agency; NASA Goddard Space Flight Center; National Science Foundation; U.S. Department of Commerce, NOAA National Weather Service; U.S. Army Corps of Engineers; U.S. Department of Agriculture, ARS, NRCS, and USFS; National Hydrologic Warning Council; Association of Floodplain Managers; Defenders of Property Rights; and the Global Ecosystems Center.

Work groups include:

- Hydrologic Frequency Analysis Work Group
- Extreme Storm Events Work Group
- Hydrologic Modeling Work Group
- GIS Applications in Hydrology and Hydraulics Work Group
- Satellite Telemetry Interagency Work Group

The Hydrologic Frequency Analysis Work Group is evaluating potential improvements to Bulletin 17B and the "expected moments" algorithm (a new statistical technique for estimating moments of the Pearson Type III distribution). It also is evaluating and comparing how the algorithm and Bulletin 17B analyze data sets with historic and paleoflood data, low outliers and zero flows. The work group website is: <http://acwi.gov/hydrology/Frequency/index.html>.

The subcommittee's Extreme Storm Events Work Group is developing a proposal for updating PMP estimates for the U.S. using a 2-Phase approach; defining functions, capabilities and requirements of the Federal Interagency Technical Oversight Group; and evaluating and testing of select new methods for PMP updates of HMRs. This work group's website is: <http://acwi.gov/hydrology/extreme-storm/index.html>.

Other subcommittee activities include federal data sharing and preparation of the SOH Connections Newsletter. The ACWI Subcommittee on Hydrology website is located at: <http://acwi.gov/hydrology> and the SOH newsletter website at: <http://acwi.gov/hydrology>.

**Subcommittee on Sedimentation:** Amanda Cox; Colorado Water Resources Institute

Amanda Cox, subcommittee vice-chair, gave the overview of the ACWI Subcommittee on Sedimentation. Current efforts and lead contacts include: RESSED – The Reservoir Sedimentation Database, John Gray (USGS); NSMD – The National Stream Morphology Database, Matt Collins (NOAA); Sediments Hydro-Acoustics Workshop, John Gray (USGS); Reservoir Sustainability Workshop, Tim Randle (USBR); and the Joint Federal Interagency Sedimentation and Hydrology Modeling Conference, Doug Glysson (USGS).

The Reservoir Sedimentation Database is a 1950's-era Soil Conservation Service database that records changes in capacities from bathymetric data on 1,824 reservoirs and 6,618 surveys. It is based on Soil Conservation Service Form 34 and is available in 3 formats: a Microsoft Access database, an interactive map, and an online master list of data sheets.

The total percent of reservoir capacity lost as indicated by the most recent set of surveys (having a mean date of 1960) shows that about 32% (432 out of 1,365 reservoirs) have lost between 10% and 30% of their capacity.

The uses of reservoir sedimentation data include:

- Determine possible threats to public water supply
- Fine-tune water releases to minimize capacity-loss effects on flooding
- Design reservoir sediment-storage allocations
- Manage sediment deposits
- Rehabilitating aging or damaged structures
- Designing sediment-sluicing and other sediment-management structures
- Estimating mass of captured sediment and associated solid-phase constituents, such as carbon
- Assessing resource conditions related to land cover, land use, and rates of erosion and sediment production

While the sedimentation database is potentially indispensable, it only includes information on 1,824 reservoirs out of the 80,000 or so dams in the National Inventory of Dams and the six- to nine-million impoundments in the U.S. (USGS National Hydrography Dataset; Renwick, Miami of Ohio)

Hence, the number of reservoirs in RESSED is only about 2% of number of dams in the NID (but not all cross-listed) and 0.03% of U.S. impoundments. Considered by numbers of reservoirs, those in RESSED are much less than the “tip of the iceberg” and more akin to the “drop in the bucket.”

Given the need, the future of this database is uncertain. The July 2011 ACWI resolution of support is non-binding and no long-term funding has been identified. Absent funding after September 2012, the effort will unfortunately go more or less into "suspended animation."

The National Stream Morphology Database primarily includes channel and floodplain geometry and bed material size measurements. Stream morphology data have a wide range of applications and uses, including:

- Culvert and bridge design
- Rainfall-runoff modeling
- Flood inundation mapping
- Channel stability/sediment source investigations
- Climate change studies
- Navigation studies
- Habitat assessments
- Landscape change research

The National Stream Morphology Database Work Group has been involved with development of national common reporting standards and a strategy for exchanging consistent stream morphology observations; issuing recommendations to the Subcommittee on Sedimentation in April 2011 on conceptualization and development of a national stream morphology database; and convening an ad hoc subcommittee to make recommendations for advancing a national stream morphology data exchange.

The ad hoc committee is creating ArcGIS online spatial portal guidance, with two guidance documents to be authored to support the spatial portal. It also will charter the portal's steering committee. The intent is to provide best practices for data packaging and submission. The group is pursuing full funding for a study to more deeply examine existing databases and the data needs of the community with a proposal to the USGS and NIWR National Competitive Grants Program entitled "Development of Design Specifications for the National Stream Morphology Database."

The ad hoc committee also is slated to critically review available morphology data and their origin, and databases and information systems relevant to the national stream morphology database. It also is working on conceptualizing and formulating the design specifications for the national database, and assembling an NSMD blueprint for an actual watershed using existing resources.

The subgroup published a Forum article in the American Geophysical Union's Eos newspaper on May 15, 2012. It describes their efforts to date and invites interested parties to participate.

The subgroup also recently sponsored a Joint USGS–CUAHSI workshop on sediment hydroacoustic techniques for rivers and streams in March 2012. The three-day workshop addressed technological advances in the field, calibration and uncertainty issues, applications, and potential opportunities to use the technology to address new research questions.

The subgroup also plans a reservoir sustainability workshop in Lakewood, Colorado on July 10-12, 2012 with the goals to develop and describe practical options for managing sediment for long-term reservoir sustainability in the US; develop a white paper that summarizes discussions,

conclusions and recommendations; and help raise awareness of reservoir sedimentation issues, as well as present ideas for achieving reservoir sustainability.

Finally, the committee has begun efforts to plan the 2014 Joint Federal Interagency Sedimentation and Hydrology Modeling Conference.

More information is available at <http://acwi.gov/sos>

## **Comments, Questions & Answers**

David Berry mentioned and Wendy Norton corroborated that subcommittee and work group memberships were usually open, should SWRR participants want to get involved.

Rich Juricich asked how other groups might share data and how in California they are struggling to create a single one-stop shop for data. Wendy responded that ACWI is grappling with that issue, too, and are not at the point, yet, where all various portals could be wrapped into one. Just doing a gap analysis of what should be in a database is a big challenge. Bill noted that if we solve our local data management problems, technology will allow for merging later.

In general, ACWI and its subcommittees have the mission to facilitate collaboration and communication within water science community, and are not focused on broad outreach or public education.

Ground water, too, seems to suffer from a lack of attention. A country watershed manager in Napa valley, for example, recently mentioned that three developments in the city of Napa had wells go dry, yet you don't hear discussion of ground water concerns in the county. It is the primary source of water, not just for humans but for the wine industry. Couldn't outreach at some point help get people to understand the importance of ground water? The concern was noted and people were encouraged to consider outreach in collaboration with local municipalities.

Katherine Smith mentioned that the national fish habitat management plan was assessing all reservoirs across country. She sees an opportunity to coordinate with the Subcommittee on Sedimentation and others to identify existing data sets. The national fish habitat partnership is concerned with all reservoirs, public and private.

Marianna Grossman asked if the subcommittee had considered using Google Earth as repository. Wendy noted that ACWI can draft resolutions making suggestions, calling attention to such opportunities and various other good efforts that "Agency X" should fund, but it is advisory and its recommendations are not binding. Amanda noted that workshops on reservoir sedimentation involve people who must deal with those issues. They discuss opportunities there.

Peter Evans said he was amazed at the number of interesting and important tasks that ACWI subcommittees are pursuing. It would be good for nonmembers to be given access to meetings.

ACWI and its subcommittees may be the best-kept secret of the water community. Wendy noted that she provides schedules and posts minutes of all committee meetings. How to get information out to a broader community is a challenge.

Integrating the work of the various subcommittees is in itself a job. The first steps are to list accomplishments, and develop working group factsheets and FAQs describing what ACWI would most want others to know about what it is doing, what issues it is trying to solve, etc. The Federal Register is a place where questions are open for others to comment. For the long haul, better communication is needed.

**Lunch Speaker: Maureen Sullivan**, Director, Environmental Management Office of the Deputy Under Secretary of Defense (Installations and Environment)

Maureen Sullivan opened by letting participants know how important water is to the Department of Defense.

**BUILDINGS:** The DoD operates 298 thousand buildings with a replacement value of over 87 billion dollars. GSA says they are the “government’s landlord” but they maintain only 12 thousand buildings! DoD is managing facilities in all climate zones of the world.

DoD manages and supports a large number of people: there are 1.4 million active duty personnel, 700 thousand civilians, plus the National Guard, reserves, retirees and all their families. DoD is purveyor of drinking water to 2.2 million people. Water is a big part of the DoD portfolio. A military base has everything a small town has: hospitals daycare, grocery stores, schools, fast food outlets, bowling alleys, big gyms (the military must be physically fit!) - all are water users!! DoD water use in buildings averages 53 g/gross square foot In FY 2009 DoD reduced the gallons of water consumed per gross square foot of building space by 4.6 percent relative to the FY 2007 baseline.

**HAZWASTE** cleanup sites: Maureen told the group there are 30,000 DoD sites contaminated with hazardous substances. The liability is \$ 13 billion as of today and this is recalculated every year). There are a lot of remaining issues in ground water, risk prioritization, pollution sources, pathways, and receptors. If there is no pathway or receptor, DoD only does monitored attenuation checking every five years. They are going after the dirtier water sources first. At some time, ground water that people are not using now may become source water in the future so the \$ 13 billion cleanup figure may change as more use currently “unusable” ground water gets cleaned up.

**SPECIES:** There are 420 endangered species on DoD land and 528 species at risk. Seventy species only found on DOD lands! Activities from other parts of the country are being moved to Fort Huachuca Arizona. It has a very dry environment so obviously activities use a lot more water, drawing from river that is habitat for an endangered bird. The rate of drawdown not sustainable for species. The fort did lots of water conservation to keep the river level high enough. But when people are moved to a community, all the defense contractors also move to town, so water levels went down again.

INDUSTRY: DoD has the equivalent of industrial plants. They build and maintain ships and do other industrial type activity.

At the Department of Defense, talk about water is from a mission standpoint: there are a range of issues to think about. How do water and lack of water impact the ability of DoD to complete its mission. The mission is summarized as the 4 ds: deter, defend, and defeat decisively. Everything relates to that not about saving birds but about ability to fulfill the mission. DoD has never defined how much water we need to accomplish our mission. They use water but haven't considered long term sources in the future. We need to strategically think about this from a mission perspective.

At a military base in Hawaii Maureen asked how they were doing on water conservation. They set they met their 10-year goal for reduction in one year by asking the landscaper to watch irrigation. Maureen said "You're in Hawaii – why are you irrigating landscaping in Hawaii? Why use limited and expensive fresh water for landscaping in Hawaii? DoD must think about conservation.

Another challenge is – do we "own" the water. DoD is used to taking water from various sources and assumes it has water rights but is that actually true? A lot of bases don't know. An Air Force Base in New Jersey has been fighting with state for seven years over who owns rights to the water under the base. New Jersey is one of original colonies with different water rights law. It's a whole different world. The military has thought of military bases as cylinder, thinking "we are ON OUR OWN" – not thinking we share resources with surrounding communities. Are we prepared to share and negotiate with communities around us? How will we share that water? We need to actually be prepared to be partners.

WATER SECURITY – The Department is doing huge security vulnerabilities assessments at all installations looking at security risks. Water use is classified on bases so how to share with surrounding communities for joint planning?

DoD will cut \$529 billion from its budget before sequestration (everything will be off the table if the budget goes to sequestration). How can we convince leadership which is trying to 1) recover from Iraq and figure out how to get out of Afghanistan 2) rebuild weapons systems in a poor economy 3) health requirements associated with budget –that there is nexus between water and the mission (deter, defend, defeat decisively). There must be an imperative for mission – otherwise we won't get their attention or the money. Remember Al Capone said, "No matter what they're talking about, they're talking about money".

The approach must be SYSTEMIC not ANECDOTAL. There IS growing awareness about climate change. DoD has quadrennial defense review every 4 years related to what it should be doing. The most recent one did talk about climate change for first time in terms of 1) navigating arctic and 2) infrastructure. Also the military are beginning to think about 1) storm surge 2) sea level rise and 3) infrastructure. Leon Panetta spoke last month about climate change in a major speech which gives Maureen a foot in door to discuss this issue more holistically including establishing budget requirements. Getting there is an incredible challenge!

There are big issues:

- role of technology
- role of science, how base decisions
- if asking military installation to write water plan, where should they go for information on how to be more efficiency in water use?

All bases now must do master plans. Until now, base landscaping is all northern Mid-Atlantic or Midwest landscaping, and does not consider that most bases are in other climate zones. There is a plant list of what all bases should have! Making landscaping suitable for the climate of the base will make a big difference. Currently the Department is focused on ENERGY but water may be the next big issue. The focus on energy is security – to get off the grid to form an “island” so if the grid goes down the base can still operate. One base is building a huge solar facility and discovered that solar panels must be washed. It then discovered there is only 30 years of water left for entire base before the solar panels are installed!

### **Questions and Comments:**

Are base closures saving water? A: Communities around bases are saying they need to figure out how they can support their local base and are discussing the issues relevant to that base and relationships are being built.

Warren Flint: There are numerous conflicts in the world around water. It surprises me that that is not enough to draw attention to what you do. A: So far, what the military is learning about water is not included in that part of dialogue. The US military is not involved until the point of crisis.

John Wells: With bases seeking to get off the energy grid – can they also get off the water grid? A: The Army has a net zero water effort. What is net zero for water? Kristine Kingery, Acting Director of Army Sustainability Policy will address that in her talk. Unless a base controls a whole aquifer or water source there is interdependence with nearby communities.

Is DoD is working with USGS to build databases and methods? A: The next step for is for science information sources to feed into this process. DoD will have to build more relationships. So far we have not seen water-energy nexus to the extent other agencies have. There are more fundamental energy issues such as still working to get electric meters on more of our buildings.

EPA policy question: Less money spent on water and energy means more money for the strike force – has that helped? A: We’ve got good utility folks, negotiated great utility rates and this undercuts arguments for energy savings. Much of the total energy use – almost 75% – is for flying planes. Buildings account for a small percentage and also our water systems are ancient and not well monitored. If we look at how much energy it takes to run those water systems, we will see a greater nexus. Right now, there are too many fundamental problems.

Marianne Grossman: There are opportunities for reuse of impaired water, for example of water used to clean solar panels. A: We are beginning to use impaired water sources. At the New Mexico base, you see a pristine green course (which we must have on all military bases, especially for the Air Force!). The source of water to irrigate the golf course is contaminated with nitrate – so the course is well fertilized also! An Air Force base has a dual pipeline system in a new building. We need to consider more of those opportunities but with almost 300 thousand buildings, we can’t just consider new buildings as much as ways to retrofit the existing building stock.

Richard Raione: There is a prediction for ten years in the future that small modular nuclear reactors will be an energy source especially for desalination plants. A: Nuclear power may be a factor for certain circumstances. With nuclear reactors we need to consider associated security issues. We don't know a lot about desalination. So far it is too expensive.

David Berry: How are you doing with respect to indicators for sustainability at bases. When consulting at the Port Hueneme Naval Base and Point Mugu naval air base we were given a tour of the base which included a highly rated LEED building. But other new buildings built since that one had none of the energy saving and water saving features. How can one great prototype impact the design of future buildings? A: We need to learn how to generalize high standard examples and incorporate features into building design across the board. We now have a sustainability plan in the Department, every agencies has initiatives for energy, water, buying green, recycling, transportation, green buildings, and community outreach.

The Federal Government must have 15% of its buildings over 5,000 s.f. meet high performance buildings guidelines by 2015. For DoD there are roughly 75,000 buildings large enough. We can't construct our way out of that! The policy is, for any major renovation or new construction, must be LEED silver or equivalent. 40% of the points come from energy or water. We use AHRAE standards 5.1 for heating and cooling for any major reconstruction or renovation.

We have great bases so we want to be gold and platinum! There is a LEED platinum fitness center at one base! How did we get to platinum? Through bid savings! The budget was estimated at \$100,000, the building was coming in at \$80,000 real cost, so the base used the extra \$20,000 to make the building LEED platinum. Congress is now prohibiting any buildings from going beyond LEED silver without a waiver! This is a messaging issue. Was it really bid savings or did consider reductions in operating costs? The base I mentioned with the 30 year water supply MUST be conserving water, so likely to be a LEED gold. We must waive those buildings from the limit of being LEED silver.

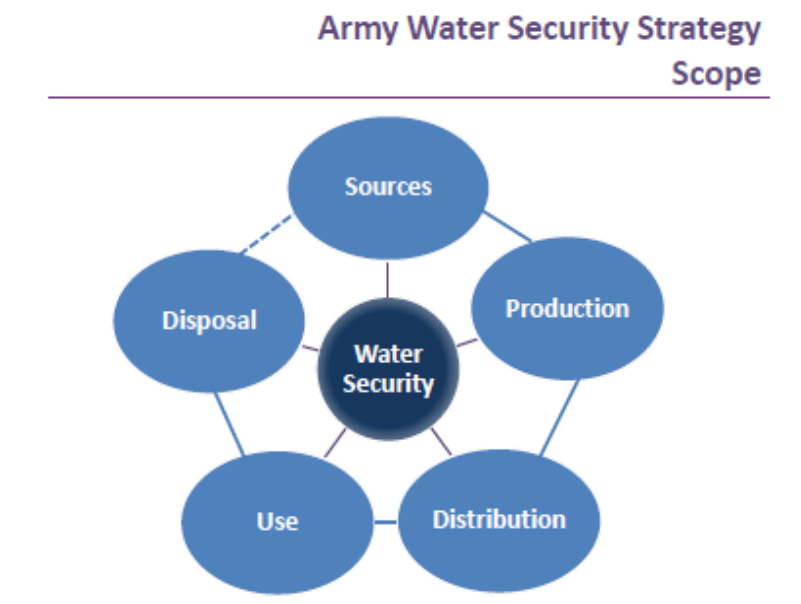
## Panel on Water Sustainability in the Department of Defense

Moderator: Bob Wilkinson, University of California at Santa Barbara

Bob Wilkinson noted that in previous SWRR meetings we have talked previously about federal, state, science approaches to water security but not the perspective of the Department of Defense. He described speaking at the Center for Naval Analysis, attended by very senior level people. There were a number of well referenced articulate reports on climate and energy considered from a security standpoint. He was asked to speak at a public meeting at the pentagon. Half of the participants were in uniform. All asked very insightful questions. The major considerations were security issues for water. It is a very real issue. What leads to conflict? How it be avoided? If the base is an "island" off the grid it doesn't help with what's happening around you. How do you increase resiliency for the surrounding communities. There needs to be partnerships among communities, state agencies, and federal agencies.

## Army Water Security Strategy Paul Koch, Water Resources Consultant. Marstel-Day LLC

Paul Koch, water resources consultant for Marstel-Day LLC provided an overview of an army security strategy that Marstel-Day prepared for the Army Environmental Policy Institute. The report was published in December 2011. The purpose of this effort was to (1) provide a complete workable definition for Army water security, (2) conduct the first comprehensive study of water security management in the Army, and (3) identify the key issues on which Army leadership can focus to ensure that the Army has enough water of suitable quality for the foreseeable future.



There were three key motivators for the project:

1. The institutional Army (permanent installations) with its increasing regional demand for water and uncertainties of availability, quality, cost.
2. The operational Army (expeditionary operations and contingency basing) with fully-burdened costs of bottled water and infrastructure challenges.
3. The supply chain with its relationships between procurement and local water situations.

A review of key policy drivers was followed by visits to army installations and a series of interviews of personnel inside and outside the Army. The culminating effort identified four major goal areas:

1. Water Resources Sustainability – Preserve Sources, Protect Rights

- Anticipate long-term water requirements
- Protect water rights
- Influence long-term water management outside the fence line
- Eliminate installation water planning inefficiencies
- Provide comprehensive water security guidance for installations
- Coordinate, refine, and test emergency response plans and preparations
- Integrate water assessments into strategic decisions

2. Water Resources Sustainability – Reduce Demand

- Reduce water withdrawal and consumption rates
- Match water quality to water use
- Sustain a culture of efficiency and conservation
- Tailor conservation expectations to differences among installations
- Mitigate adverse consequences of aggressive conservation

3. Strategic Investment – Maintain Infrastructure Integrity and Security

- Develop funding baseline for all retained and privatized systems
- Recapitalize: Fund sustainable restoration and modernization (SRM) sufficiently to provide for recapitalization of non-privatized infrastructure
- Accurately anticipate cost increases resulting from privatization and budget accordingly
- Provide advance planning, contractual flexibility, and adequate staff support to implement and administer Army water privatization contracts
- Provide internal/external infrastructure compatibility
- Install robust contamination risk reduction technologies
- Assess the vulnerability of water and wastewater infrastructure to natural mishaps

#### 4. Water Security at Contingency Bases – Increase Self-Sufficiency, Reduce Risks

- Reduce water use
- Engage partner nations concerning military water use
- Assist host nations with water resources sustainability
- Implement (DOTMLPF) solutions identified by the Army Base Camp Capability Based Assessment
- Ensure timely transition from bottles to local water
- Increase infrastructure adaptability
- Rebuild critical internal organic water supply capabilities
- Implement best practices and policies for distribution of water for personal hydration

Several recommendations from the report were highlighted.

- a. Primer to engage water resources stakeholders. (There is a primer for land use.)
- b. Reference on how the Army secures its water.
- c. Installation water atlas following upstream: surface water, ground water, infrastructure. Maps to determine the area of interest not just political boundaries and to show where stakeholders are rather than assuming similarities among bases.
- d. Adapt Utah and Hawaii approach to water policy supporting military installations. These states address have established priorities concerning defense requirements for water during times of drought.
- e. Apply National Drought Mitigation Center (NDMC) drought readiness guide to establish “Drought Ready Defense Communities”.
- f. Long-term support for water planning software.
- g. Frame water issues now for the next BRAC (base realignment and closure) round, not at the end of the process.

Link and Contacts:

Army Water Security Strategy <http://www.aepi.army.mil/>

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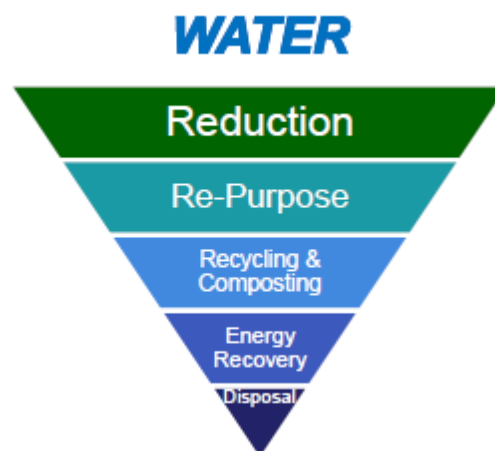
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**Sustainability in the DOD - Army Net Zero Water Initiative** Kristine Kingery, Acting Director, Army Sustainability Policy, Office of the Deputy Assistant Secretary of the Army

Kristine Kingery, Acting Director of Army Sustainability Policy leads the Army's sustainability effort. The Net Zero Water Initiative brings aspects of sustainability into army culture. She notes that we live in interesting times, with multiple threats that range from terrorist attacks to natural disaster. Army installations are facing droughts, instable weather, and tornados. They need a lot of space so they end up out of the city. This means transmission lines, water transmission, and power. So when something happens, the army gets hit first. We need to consider the army of today and into future.

We need to consider how to appropriately share resources among soldiers, families, and civilians, ensure sustainable practices throughout appropriate levels of the army, and maximize operational capabilities. These ideas need to be put in terms the army understands. For example, 80% of what's carried in a convoy is fuel and water. About one in 50 convoys has a casualty. If we can reduce the amount of fuel and water needed on site it will reduce transport and save lives. If fewer people are needed on a convoy, more can be in the fight, defending the nation, not involved with logistics.

The Net Zero approach is a 5 step inverted triangle.



Net Zero considers energy, water, waste, and an overall Net Zero installation.

A Net Zero WATER Installation limits the consumption of freshwater resources and returns water back to the same watershed so as not to deplete the groundwater and surface water resources of that region in quantity or quality.

A Net Zero ENERGY Installation is an installation that produces as much energy on site as it uses over the course of a year.

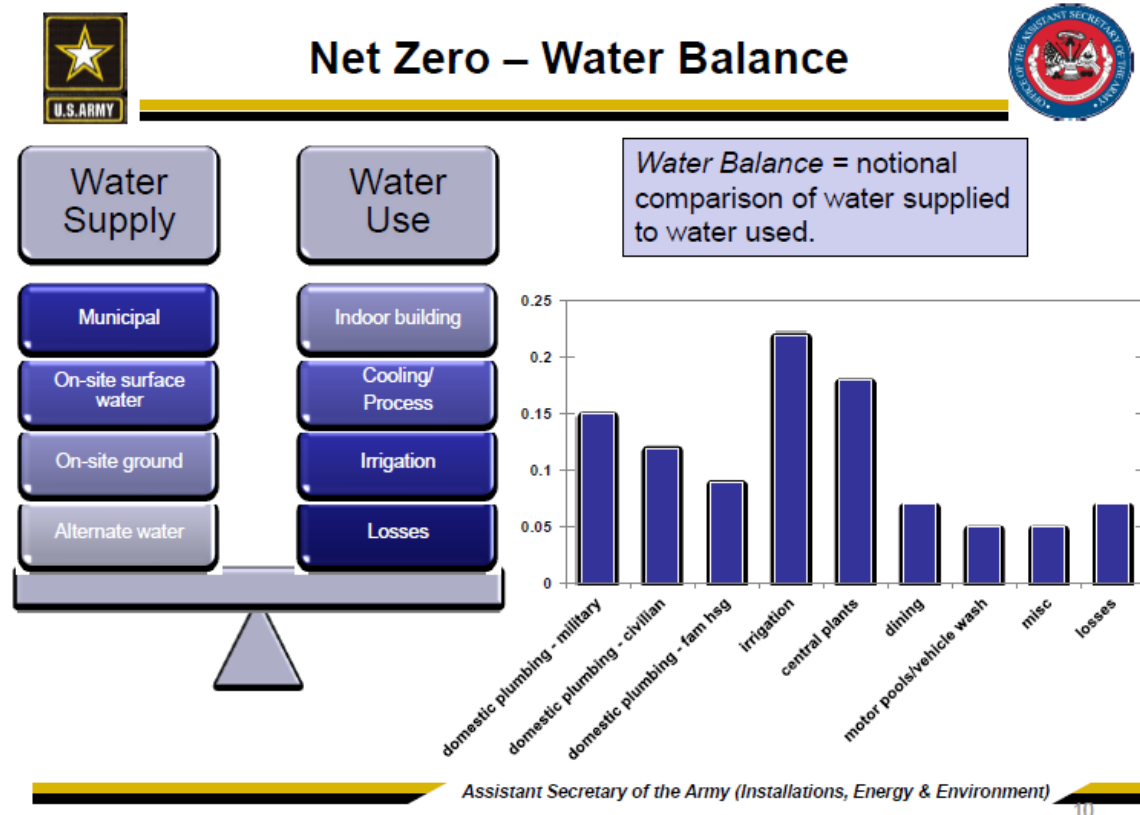
A Net Zero WASTE Installation is an installation that reduces, reuses, and recovers waste streams, converting them to resource values with zero solid waste to landfill.

An overall NET ZERO INSTALLATION applies an integrated approach to management of energy, water, and waste to capture and commercialize the resource value and/or enhance the ecological productivity of land, water, and air.

We look at Net Zero as a water security strategy. Since we don't "produce" water like we do energy we must manage what we have. The water used in a specific location may not be from local water sources. Water systems are vulnerable to contamination as a weapon. EPA is working on security of water systems. We need to consider this within the army. Net Zero is helping us return as much water as we can.

Goals of a Net Zero water installation:

- Contribute to the Army Campaign Plan's water security Major Objective
- Reduce freshwater demand through water efficiency and conservation
- Access/develop alternate water sources to offset freshwater demand
- Develop water-efficient green infrastructure
- Implement low-impact development to manage storm water



## Net Zero Pilot Studies

### Tobyhanna Army Depot, PA

- Replaced potable water with process water for foam suppression at a wastewater treatment plant: a \$1,200 investment that saves 300,000 gallons/month with a one month payback period.
- Installed a water chiller to replace a single-pass cooling system: a \$125,000 investment that saves 2,000,000 gallons/month with an eight month payback period.
- An acoustic leak detection survey identified six system leaks responsible for 26% of average daily water use.

### Camp Rilea, OR

- Recent efforts include conversion from spray to rapid infiltration basins; a recycled water plant that converts 65% of effluent to Class A water; two new wells and a storage reservoir.
- Planned efforts include conversion of a wash rack to use Class A water; expansion of water reuse from 65% to 100%; replacement of turf grass with drought-tolerant native species; installation of low-flow fixtures; implementation of rainwater harvesting

External collaborators on this project include Federal Agencies (DOE, EPA, GSA), local and regional partnerships, and public–private partnerships.

More information is available at <http://army-energy.hqda.pentagon.mil/netzero/>

## **US Army Corp of Engineers Actions around Climate Change** Jeff Arnold, US Army Corp of Engineers

Jeff Arnold of the US Army Corp of Engineers (USACE) discussed the USACE climate change mitigation and adaptation work and their related interagency efforts.

Federal Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance) was signed by President Obama in October 2009. Although only fifteen pages long, its scope is very broad, covering energy and water use and terms for all Federal agencies to reduce them and the greenhouse gases (GHG) associated with them. EO13514 is the organizational motivation and the formal basis for GHG reduction at all Federal agencies and requires them to set their own targets and develop a Strategic Sustainability Performance Plan to achieve their targets by 2020.

USACE Civil Works does some very different kinds of things from rest of Army so it can be difficult sometimes to integrate things like reservoir management with war-fighter support or

other elements of the larger Department of Defense (DoD). For this reason, USACE reports its EO13514 progress on climate change mitigation (greenhouse gas reduction, water and energy use reductions) separately from the general reporting done for the rest of DoD. So, for example, USACE has set a target of 23% reduction on some sources of greenhouse gases while the rest of DOD has a target of 34% for these sources.

Similarly, USACE has a separate climate change adaptation plan from DoD, which is also required under the terms of EO13514. USACE will file the first of its agency plans, required of all reporting Federal agencies (roughly 69 in all) in June 2012 with the White House Council on Environmental Quality (CEQ) and Office of Management and Budget (OMB).

It can be hard to understand how large the differences in operations and in requirements for GHG reduction and climate change adaptation are among different Federal agencies like USACE, the Railroad Retirement Board, the Social Security Administration, and other agencies. The different climate questions faced by these and other agencies are in part organized through CEQ and the White House Office of Science and Technology Policy (OSTP) to address issues common to all agencies and ones applicable in specific areas like water resources. Part of the climate change work USACE does is through various working groups of these White House coordination offices as we work to have integrated answers for the very many basins where we operate with other Federal and non-Federal partners.

To address differences in requirements for data and other services, the US Global Change Research Program (USGCRP) (see [globalchange.gov](http://globalchange.gov)) is working to bring Federal agencies together and help supply them with climate change information. USGCRP has just released its ten year plan built around four strategic goals: Advance Science, Inform Decisions, Conduct Sustained Assessments, and Communicate and Educate.

The first two goals call for advancing the scientific knowledge of the integrated natural and human components of the Earth system with integrated observations, indicators, and numerical models built, applied, and interpreted in ways that can help people make decisions and take actions for mitigation and adaptation.

The third goal involves a number of applications from the first two and specifically supports the US National Climate Assessment (NCA), which has been required by law to be produced every four years since 1990. Release of the next NCA is planned for 2013 and will be the product of a massive effort of Federal and non-Federal government, NGOs, academics, Tribes, and many other individuals organized and directed by Kathy Jacobs, OSTP Assistant Director for Climate Adaptation and Assessment.

The fourth goal is designed to use products from goals one through three to help communicate climate change issues and education people in the US and around the world. One part of this goal will be making the 2013 NCA available electronically as both the report and the data that went into the report so users can make additional analyses and applications.

USACE has a very active role at USGCRP and is involved with all four of its new goals as direct parts of its climate change adaptation programs.

USACE global change adaptation work can be roughly divided between coastal and inland hydrology. Coastal concerns include vulnerabilities and possible adaptation measures for harbors, intracoastal waterways, beach and other shoreline protections, storm damage reduction defenses, environmental restoration sites, and other projects. Inland concerns include the more than 700 dams and reservoirs, 14,000 miles of inland levees for water control and inland navigation, hydropower production facilities, flood risk reduction structures and operations, more environmental restoration sites, and other projects.

Because climate change will affect nearly all human interaction with water, many of these coastal and inland operations are at some risk from some type of climate change effects. USACE is now working to characterize those types of climate change threats, the types and extent of our potential vulnerabilities in coastal and inland projects and programs, and our capacities to adapt these projects and programs to current and future climate change effects.

Like others, USACE has made the most progress with its coastal concerns since the threats and possible adaptation measures for sea-level change are relatively easier to typify and describe than the ones for inland hydrology. USACE has had national policy on sea-level change since 1986 and last updated its guidance on sea-level in 2011 with Engineer Circular (EC) 1165-2-212. In this EC, we describe our approach for using three equally probable curves (determined at each coastal location since local variation matters) for characterizing the threats from sea-level change and explain how to consider these curves in relation to possible adaptation measures over time. One of the important lessons here was realizing that planners and engineers need to be present at the very beginning of this sea-level change work so that the different considerations for long-term plans and the engineering to support them to sustain new or refurbished structures in the face of climate change threats.

Progress has till now been slower for climate change threats and impacts to our inland hydrology concerns because of the much wider types of climate change threats encountered there and the more diverse set of impacts and possible responses. Form, frequency, duration, and location of precipitation is projected to change markedly in some places - and has been changing already over the last 50 years in places like some of the snow-dominated basins of the western US. But other global changes like changes to land use and land cover types and demographic shifts also interact with these climate changes to affect water runoff and streamflow timing which can make it difficult to create consistent national policy for inland hydrology on pieces like flood magnification or return period changes, drought frequency and severity, and changing sediment loads to our reservoirs. USACE has been learning from a series of climate adaptation pilot projects running since 2010 and will release its first, high-level climate change policy for inland hydrology later in 2012.

And a final piece of our work common to both coastal and inland climate change is developing a framework and set of measures for reporting our progress against the climate change threats

and the effectiveness and efficiency of our adaptation actions to counter them. This type of evaluation reporting is crucial for both internal USACE program functions and for external reporting to Congress and our stakeholders since we want to know and demonstrate that our characterizations of the threats are correct and our actions to reduce vulnerability and enhance resilience have been worthwhile.

More information is available at <http://corpsclimate.us>

## **Panel on Current Work on Water Sustainability in Federal Civilian Agencies**

Moderator: Deanna Stouder, US Forest Service

### **Water Sustainability at U.S. EPA** Ron Hoffer, Senior Advisor on Water Sustainability, US EPA

Ron Hoffer, Senior Advisor on Water Sustainability for the US Environmental Protection Agency began with a quote from EPA Deputy Administrator Bob Percasepe, “sustainability is a continuum...” Consider the 1970s with the burning of the Cuyahoga, broken irrigation systems, wastewater ponds, and lots of contamination. We don’t see so much of these issues in modern US. There have been significant wastewater treatment plant improvements. We are moving towards the Clean Water Act goal of swimmable, fishable, and drinkable water. These advances occurred because of legislation (e.g. Clean Water Act, Safe Drinking Water Act, and Waste Resource Recovery Act) and because there was a media or submedia focus on the issues.

More recently, sustainability and the fact that social and economic cross-media issues are taken into account has supported progress. There is now a more holistic look in and outside the US and when we talk about water it is more integrative. Globally we see connections between energy and water. Bob Percasepe is right about the continuum of sustainability and EPA is trying to help. In 2010, the EPA asked the Natural Research Council (NRC) to move towards sustainability more holistically. In Sept 2011 the NRC issued Green Book recommendations to EPA.

#### **Green Book Recommendations:**

- Comprehensive sustainability framework (breaking down silos where possible without statutory violations)
- Set 3-5 year “breakthrough objectives” (think mid and long term, not just right now)
- Develop a “sustainability toolbox” (including analytical tools)
- Risk assessment remains key to sustainability decision making (going beyond but not abandoning the old “red book” on risk assessment paradigm from 1980s)
- Focused program of change management inside EPA
- Hire multidisciplinary professionals and augment staffing from additional sectors (e.g. social and health, not just environmental)

EPA Administrator Lisa Jackson responded that the agency would consider the recommendations internally and with external stakeholders. Several listening sessions were held to develop a strategy for how to embrace the principals. Three things were identified that EPA can do.

1. Build on the Base: Spread the word on pilot projects and initiatives and expand the most promising.

Green Infrastructure for managing wet weather flows

- State Revolving Fund (SRF) allocation
- compliance incentives and technical assistance

Sustainable Water and Wastewater Systems

- Partnerships, handbooks, guidance and technical assistance
- SRF allocation for energy/water efficiency
- Utility asset management and Climate-ready water utilities

WaterSense

- Supporting water use efficiency in homes and businesses

Selected examples include:

- Urban waters and sustainable community pilots\*
- Healthy Watersheds Initiative\*
- Wastewater and biosolids reclamation
- NetZero pilots with U.S. Department of Defense
- Climate-ready estuaries\*

(\* includes focus at the watershed level)



2. Advance the tools: Share/advance current tools & indicators and broaden their range. There are a lot of tools already produced (e.g. guidance, model, technical documents) but it is not clear how much they are being used.

Some current examples:

- Tools and metrics -- effective utility management
- Tools and metrics -- Green Infrastructure
- Value of water and ecosystem services
- Modeling climate impacts and adaptation options

Emerging approaches include:

- Water sustainability indicators
- Lifecycle costing

3. Set Goals: Commit to sustainability targets and advance “breakthrough” sustainability policies.

Ideas for targets and sustainability policies:

- Green versus grey infrastructure
- Energy use at the utility level
- Water use at the utility and user level
- Incentives for rehabilitating in lieu of new infrastructure
- Reporting on sustainability measures?

The Department of Defense has both an easier and a harder job of it. It has a “regulated community” and can tell them what to do. EPA is dealing with population that’s not regulated.

More information can be found at <http://www.epa.gov/sustainability/>

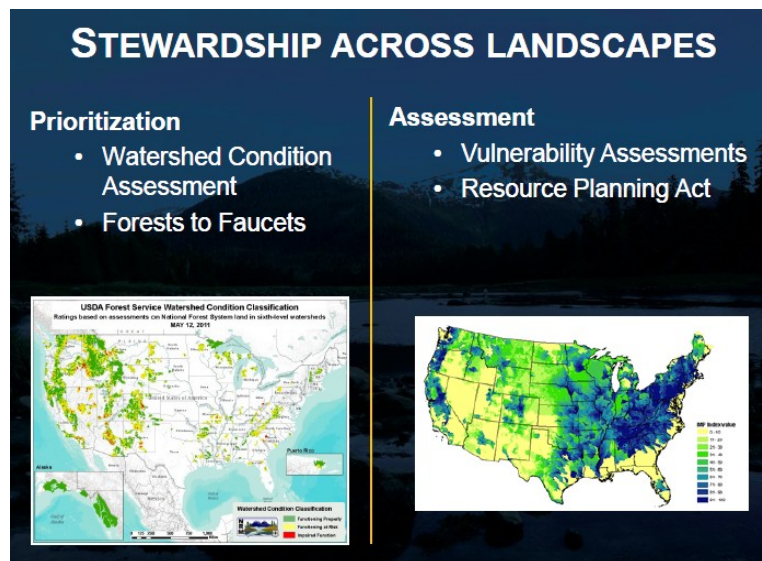
**Enhancing Water and Watershed Stewardship** Katherine Smith, US Forest Service, Research and Development

Katherine Smith, US Forest Service, Research and Development told the group that a focus on water and watershed stewardship has been at the center of the Forest Service mission. The National Forests supply domestic water, irrigation, hydropower, recreation, riparian habitat, and refugia for species. They are also the most beautiful places in the country.

- Forested watersheds provide water to 180 million Americans
- 66 million people get their water from National Forests
- Refugia for more than 100 aquatic endangered species
- 75% of our nation’s outdoor recreation is within 1/2 mile of water
- 50 million people fish the States each year

## Water Stewardship in the Forest Service

- Conservation and Restoration of 193 million acres of national forests and grasslands
- Outreach and technical support to landowners and communities
- Multidisciplinary, landscape scale science and decision support tools



The 1987 Organic Administration Act calls for the Forest Service to protect and enhance water supplies, reduce flooding, and secure favorable conditions of flow. There are several actions planned or underway to improve stewardship.

## Improving Management and Accelerating Restoration

- New planning rule
- Climate change score card
- Best management practices
- Collaborative forest landscape restoration is up to \$40million per year, is creating job and reducing wildfire risks

## Inventory Monitoring and Assessment Strategic Plan

- Water Resources Emphasis
- Include all lands and all partners
- Provide credible information
- Effectively respond and adapt

## Advancing Knowledge

- Develop new knowledge and tools to address existing and emerging issues
- Continue long-term research studies and maintain experimental watersheds
- Increase science delivery, technology transfer, and adaptive management approaches

## Informing Management

- How does climate and land use shift water distribution?
- What are the likely consequences of these changes to plants, animals, and rural urban communities?
- What are the scenarios for future forest disturbance regimes and how will they affect regimes water and aquatic ecosystems?
- What are the best metrics for measuring watershed condition?
- What are ecological and social thresholds related to watershed condition and resilience?

## Enhancing Partnership and Collaboration

In the current situation partners may be unaware of restoration priorities. Project planning, implementation, and monitoring occur without stakeholder involvement, and there is no youth involvement. In the future vision stakeholders are involved in restoration priority setting and are aware of and involved in all stages of the project (planning, implementation, and monitoring). Youth are involved.

The partnership between Denver Water and USFS is a good example of USFS Forest to Faucets Partnership. Denver Water spent \$40 million on dredging, water treatment, and other costs to restore watersheds after the Buffalo Creek and Hayman Fires. Under the partnership MOU the two partners will equally share the cost of \$32 million for ground treatment projects over five years. The goal is to reduce the risk and severity of wildfires on public/private lands to protect the South Platte Watershed

## Forest Service Water Stewardship Goals

- Conserve, maintain, and restore watersheds, ecosystems and the services they provide to people,
- Secure water of sufficient quantity and quality to sustain aquatic life and support terrestrial habitats and domestic uses,
- Advance knowledge and share science central to managing forests, aquatic and water resources, and watersheds in the future,
- Facilitate watershed--based partnerships that foster conservation and citizen stewardship.

## Forest Service Water Strategy

- Unifying existing programs
- Provide guidance and direction to meet future challenges

More information is available at <http://www.fs.fed.us/sustainableoperations/focus-area-water.shtml>

## Federal Managers Responses to Climate Change Frank Reilly, LMI

Frank Reilly, from the US government consulting firm LMI discussed LMI's new report, *A Federal Leader's Guide to Climate Change*. The report combines the best science with the best practical expertise. It introduced the concept of "Climate User".

Who are climate change users? What are the drivers with climate change? What is the users' background in climate change and how do they impact it and how does it impact them? Seven functional areas of climate change users were addressed: health, information, land use, infrastructure, vehicles, supply chain, and security. The approach taken in this report is to provide ideas for managers as climate users to mitigate and adapt to the challenges of climate change.



Challenges in addressing water and climate change include precipitation change, rising sea level, and secondary water damages.

### Mitigation themes

- Plan Cooperatively
- Seek financial benefits of reducing
- Optimize on new metric
- Take direct action
- Conduct ongoing assessments

### Adaptation themes

- Use Climate models
- Identify specific threats
- Assess risks of each
- Plan cooperatively
- Employ warning systems
- Take direct action

The report addresses adaptation strategies for each of the functional areas. Rich Skulte's adaptation recommendations for infrastructure include vulnerability assessments, flood control systems, and adaptation to sea level rise through land use and migration. In Taylor Wilkerson's chapter on the supply chain mitigation-adaptation focuses on flexibility in approach, risk management, cost effective approaches with changing risks, and the importance of minimizing the impacts of the supply change today. Transportation management adaptation strategies from Julian Bentley include addressing vulnerability of critical infrastructure and flexibility to shift between modes of transportation.

David Reilly wrote the chapter on land use. His climate users are land managers including BLM, USFS, NPS, military installations, city planners, private land managers, and farmer and livestock producers.

The messages we are getting about climate change do not explain what it means for everyday citizens. What is being said versus what is not included is very important. For example, "Climate change means global warming".

What they are saying – Greenhouse gasses are increasing.

What they are missing - A local approach might work best; Federal managers can preserve the mission and mitigate.

What they are saying - Melting Icecaps and glaciers equal sea level rise.

What they are missing - Saltwater intrusion into rivers and groundwater will damage crops and habitat.

What they are saying - Temperatures are rising.

What they are missing - Warmer winters don't kill pests; "release" of invasive species.

## Recommendations

1. Use a local approach to prove the concepts: Challenges include lack of trusted world agents and the lack of federal government authority. The solution is a bottom up approach. In Lynchburg, VA lawns in highway clover leafs were replaced with woody plants, resulting in less mowing and more carbon sequestration.

2. Use Federal Land Management to mitigate: Can't force actions on private land owners but neighbors will see the benefits of actions. Federal land managers must focus on "mission first". They need authority. But they can use existing land management tools, such as army buffer zones, wetland and conservation credits, and carbon, nitrogen, and phosphorus credits.

3. Use engineering to stave off saltwater intrusion: Challenges include the destruction of the salt water wedge and salts killing crops and habitats. Solutions will come from engineering. In Richmond, VA sensors are used to shut off wells to agriculture field when salinity intrudes.

4. Use proper plantings to exploit: Challenges include salt water killing crops and habitat. Making good planting choices is a solution. For example using plants to block salt and choosing appropriate crops.

5. Joint Agency cooperation can help adapt to temperature changes: Challenges include higher winter temperatures that allow pests and invasive species. The solution is to get the best agents from among the agencies to address the problem.

There are increasing efforts to reach out to the public, and the agencies are taking watershed stewardship more seriously.

For Follow Up contact: John Selman, Program Director, LMI (703) 917-7551 [jselman@lmi.org](mailto:jselman@lmi.org)

### **Day 1 Wrap Up** David Berry, SWRR Manager

David Berry invited the participants to come back the next day. He said they would hear presentations on water sustainability applications and community participation in federal water related environmental programs. He reminded participants that a major part of these meetings is the connections made and the exposure to new opportunities. At the end of the day tomorrow we will discuss what next steps SWRR might take.

David asked the group if it would be alright to email an Excel spreadsheet with the attendee names, emails, organizations so we will be able to find each other. Proceedings and individual PowerPoints will be made available. SWRR generally has at least one meeting out of town each year but we need local partners to go to another location. There has been discussion of having a meeting in Florida but there is not a critical mass of support there yet.

## **DAY 2, May 31 2012**

**Water Sustainability Applications:** Moderated by Jill Parsons, Ecological Society of America.

While SWRR has previously held sessions addressing approaches to “water footprinting” and reduction of water footprints, this session was developed to look specifically at the integration of water footprinting into “water sustainability applications,” including examples from large industry, the US Army, and state water planning.

### **Application of Water Stewardship Tools to Large Industries: Great Lakes Case Studies,** Penelope Moskus, LimnoTech. 734-332-1200 [pmoskus@limno.com](mailto:pmoskus@limno.com)

Penelope Moskus, an Environmental Scientist with Limnotech, provided an overview of a project completed for the Council of Great Lakes Industries, in conjunction with Great Lakes Protection Fund (GLPF); National Council for Air and Stream Improvement (NCASI); and Electric Power Research Institute (EPRI). A copy of the full report for this project is available at <http://www.cgli.org/waterfootprint/waterfootprint.html>

Background: The Great Lakes region is a region that has plenty of water and, as such, has attracted many high water use industries. In recent years, throughout the world, there has been a heightened focus on water and greater attention to water use performance, with a focus on water scarcity. Several tools have been developed that address water use, including several approaches to determining the size of the water “footprint” and sustainability of water use.

There is a need for industrial water users to understand the various emerging tools, particularly where there is the expectation for industry to use of these tools. There have been concerns that water footprinting and sustainability tools might become de facto regulation for industries, and the potential impact that may have on the availability of and access to water resources, impacting the ability of industries to withdraw and discharge water. Consequently, this project was completed with the objective to “Evaluate potential relevance and utility of various tools to large withdrawal volume industries in the Great Lakes.”

Moskus noted several reasons why businesses and investors are interested in water stewardship and the associated risks, including:

- physical risks, such as potential water scarcity and quality impacts
- regulatory risks, such as loss of license to operate
- reputational risks, such as loss of market share, reputation damaged

The combination of the physical, regulatory, and reputational risks create overall financial risks for businesses and investors, with potential impacts to costs and revenues. In addition, water stewardship by industry has been an interest of nongovernmental organizations, particularly with respect to biodiversity, human health and access to water.

As a result of these drivers, several water stewardship tools have been developed. Nearly two dozen water stewardship tools were reviewed as part of this study, including:

- Water Footprint Network (WFN)
- ISO Water Footprint Standard
- Alliance for Water Stewardship (AWS)
- European Water Stewardship (EWS) Standard
- Global Reporting Initiative (GRI)
- World Resources Institute (WRI) Aqueduct Project
- WBCSD Global Water Tool
- WWF-DEG Water Risk Filter
- Carbon Disclosure Project (CDP) Water Disclosure Project
- CERES Aqua Gauge
- Global Environmental Management Initiative (GEMI) Local Water Tool
- UNEP/SETAC Life Cycle Initiative
- Strategic Water Management Framework (Australia minerals)
- UN CEO Water Mandate
- Veolia Water Impact Index
- Federation House Commitment to Water Efficiency
- Water Brief for Business
- Water Neutral Offset Calculator
- WaterSense Certification Scheme
- Water Stewardship Initiative

The watershed stewardship tools were separated into four categories of tools:

- water use accounting
- business risk assessment frameworks
- reporting and disclosure protocols
- standards and certification framework

For each of the tools, this study:

- reviewed key water stewardship initiatives and underlying “metrics”
- selected metrics for evaluation (table of 22 metrics evaluated), things like total volume abstracted by source, and total volume consumed, water transfers, total volume abstracted, water withdrawal, stress (withdrawal relative to supply), recycling/reuse, discharge amount/quality/impact. water withdrawal, etc. in final selected
- took apart each of the tools, decided what parts were preferred, what was most applicable to the Great Lakes region, and which parts were most commonly included in different tools.
- applied metrics to four industrial facilities:
  - a coal-fired power plant on Lake Michigan;
  - an oil refinery on outflow of Huron;
  - a cement plant in Ontario;
  - a pulp and paper mill in Michigan.



Voluntary participation by these four sites was crucial, since the study required access to lots of data not publically available. In addition, determining how to apply the metrics to each of the four facilities required direct back-and-forth discussions to address questions that could not be covered with a simple survey

Moskus discussed some of the findings from three of the four sites (noting that work on the fourth site – a pulp and paper mill – was completed by a different consultant):

The JH Campbell Generating Complex is coal-fired power plant that withdraws water from Pigeon Lake, pumps water upstream to the site where the water is used. After use, water is discharged offshore through deep water discharge. As with the other sites in the study, the flow of water through the system was found to be surprisingly complicated. In order to apply tools to this site, it was necessary to understand the water use throughout the facility, including groundwater recharge, consumption reported to the state, pond and canal evaporation and

The LaFarge North American Cement Plant withdraws water from and discharges to Lake Ontario. Prior to discharge, excess water is captured in a quarry and stormwater systems. More water falls on the site than the plant is using, and capture and discharge of stormwater is an issue for this site. As shown in this case study, definition of terms was an important consideration for application of water sustainability tools, particularly with respect to “consumption” of water. More water is discharged from the site than is withdrawn from Lake Ontario because of stormwater discharges, resulting in a “negative consumption” value.

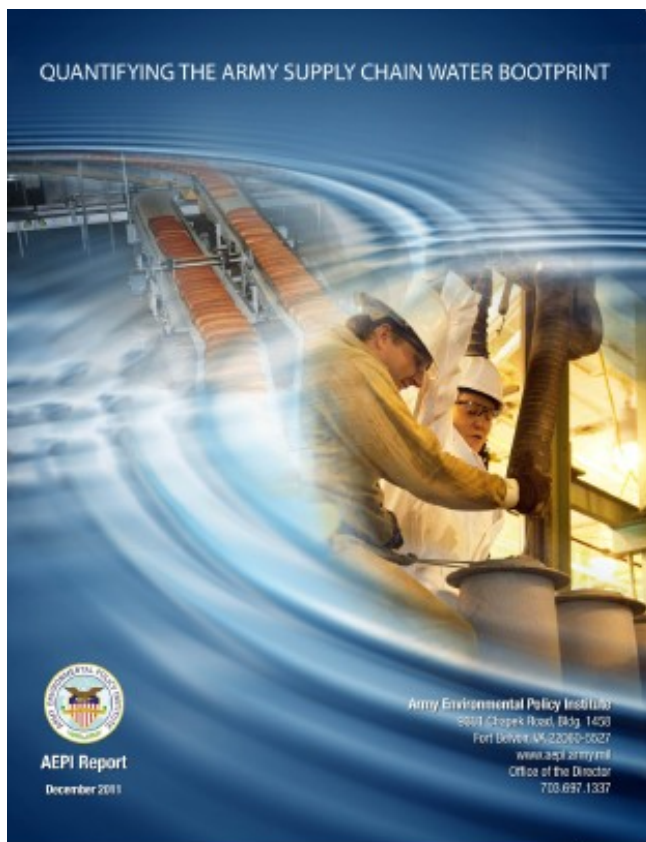
The Shell Sarnia Manufacturing Center produces refines oil products (fuels, petrochemicals, solvents). This site discharges to a creek that flows back to the St. Claire River, which flows to Lake Huron. Once again, the volume of water withdrawn is less than the total of the volume of water discharged plus the volume of water that evaporates from the site. Because the total volumes of water involved in the site and in the watershed are so large, measurement precision is difficult and there are a lot of uncertainties in water use. As with the LaFarge site, using the global water sustainability tools results in a calculation of negative consumption

After completing the review of the various tools and their applications at the four sites, the study produced several key findings and recommendations. The study found that there are a diverse set of tools that are quite useful but also have specific boundaries. The tools have different objectives, and there are risks in adapting the tools for objectives other than the ones for which they were created. Tools focused on water footprint often are missing other sustainability concerns including social and economic considerations. None of the tools were found to address the withdrawal issues specific to the Great Lakes Compact Agreement

During the Question period, there was discussion of the lack of news coverage of the work begin done by industry on water footprinting and water sustainability. It was noted that industry doesn't like to talk about what it does for several reasons. One reason is the competitive advantage of not sharing information on the factors of production, including water, which impacts how much money can be made. Another concern is that regulatory agencies will take information given out for a news story about industry, that news story become information for tomorrow's regulation, with water footprint reductions methods used by one company becoming a limit imposed on other companies, even when the same method may not be applicable, driving up costs for operations. It was noted that a great deal of regulation begins with information found in news stories. Consequently, extracting good news stories out of industry may be "like pulling teeth." Many of the industrial conversations have begun with the basic consideration of how to improve sustainability of all operations, across all aspects of production, not just with respect to the environment, but also workforce needs and market receptiveness.

For more information contact Penelope Moskus, LimnoTech. [pmoskus@limno.com](mailto:pmoskus@limno.com)

### **The Army Water Boot Print** Frank Reilly, LMI. [FReilly@lmi.org](mailto:FReilly@lmi.org)



The Army Water Bootprint Study was completed by Frank Reilly LMI, and Marc Kodack US Army. As noted by Reilly, Kodack is someone who "thinks the big thoughts" and identified a need for a water footprint to follow on the heels of the energy footprint – which, in the Army, has been called a "bootprint." The public domain report from this student is available at [www.aepi.army.mil](http://www.aepi.army.mil). The purpose of this study is to provide an initial quantitative estimate of the amount of water embedded in the goods and services the army procures throughout the supply chain." Reilly noted that, for security reasons, the army does not provide water data to the public. Unlike companies like Coca Cola, which spent a year determining the amount of water used per coke, the army cannot calculate the water use required for each of the "widgets" used to support

each individual in the army (the “warrior”). Instead, the army footprint was calculated by focusing on water use for a few of the “widgets” used to support the warrior, and the total water footprint is then extrapolated from those calculations. While this approach may not meet the approval of many water footprint developers, this approach was created in consideration of the larger objective of the study, which was to produce a quantitative estimate of the water embedded in goods and services in order to perform a vulnerability assessments. While other footprinting methods focus on the impact of water uses on rivers, aquifers, and other water resources, the focus of the army’s study was to support the warrior.

The “bottom line” finding of the study was that the total water used by army water users is 258.4B gal annually. This total water use was determined by considering 8 different “buckets” of water:

- primary fuels
- utility energy (including steam)
- civil works (Corps of Engineers)
- MILCON (military construction, which is mainly for the Corps of Engineers but in a separate budget from civil works)
- interagency and international support (also mainly Corps of Engineers) – for nation-building activities
- supply chain databases
- AAFES Class VI stores (PX, commissaries – the “Wal-Mart” on bases)
- IMPAC purchases (as identified from credit card records)

The study objectives were to

- identify the components and suppliers of the Army supply chain
- Quantify how much water is needed to produce the goods and services the Army procures through the supply chain
- Consult with other organizations who have created, maintained, and actively monitored a sustainable supply chain
- Identify recommendations to incorporate study findings into the annual Army Sustainability Report and
- Develop recommendations for Army policy, guidance, and strategic investments

The definition used for the “army water footprint” was an indicator of water use that focused on water needed to achieve the Army’s mission. The focus was on direction operations (NOT including water use e.g. for flushes, washing), identifying the “embedded” indirect (supply chain) water use for all of the Army INCLUDING the Corps of Engineers. The volume of water used to produce one unit or piece was determined to be the water footprint for that unit or piece, and the sum total army water footprint was determined by calculated the total embedded water for all goods and services used by the army to achieve its mission.

In order to come up with amounts of water embedded in goods and services, fuel and utility data from energy footprinting studies could be used, with water-energy ratios available to determine the water factor associated with energy. The biggest challenge in this study was determining how many “widgets” the army had. Models such as Ohio State University’s Eco-LCA provided some data on economy activity and information on tanks, bazookas, rockets and other important acquisitions, with energy data used to calculate the water used to manufacture these items.

Several factors impacted army acquisitions, such as whether the data was collected in a war year versus a non-war year. Other notable considerations included the fact that many army acquisitions, such as tanks, use parts produced in many parts of the country. The parts used the most were coils and transformers. Water use can be reduced for larger items (such as tanks and other vehicles) if the coils and transformers were produced in lower water footprint regions. The study also found that the life cycle water use would be tied to the entire life cycle, not just the initial purchase.

The study found that the aggregate direct and indirect water use by the Army (i.e., the Army water footprint) is substantial and has the potential to exacerbate water supply problems in regions where army facilities are located. In addition, indirect water use for these procurement items can also impact the availability of water for direct use by Army installations and activities when producers withdraw water from the same supply source(s).

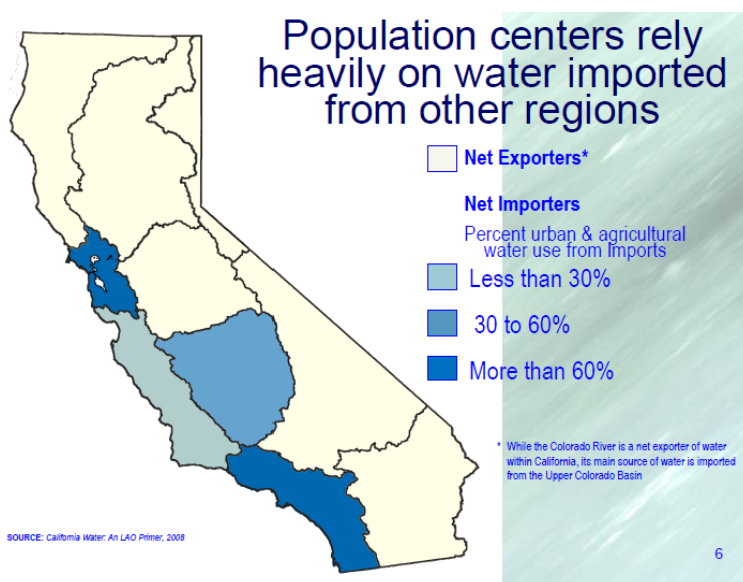
The study included several recommendations for the Army to consider in their purchasing decisions to support operations:

- Conduct a more detailed analysis of the largest suppliers and their water sources.
- Identify critical supply chain products and services that are also large water users
- Identify time-sensitive products and services that may be delayed by water restrictions
- Develop a strategy to identify suppliers of critical products and services at risk of production curtailment when water shortages occur and provide a reliable alternative

Reilly recommended that the Army ask the “Wal-Mart question” on sustainability – how much water used to make widget we are buying? He also noted that widget buying decisions may be based upon congressional district, which may be a poor choice based on water use.

During the question period, there was discussion of the challenges of the lack of sharing of data. Reilly noted that water use reductions have sometimes been calculated through accounting methods that showed that bases were no longer irrigating areas that already were not being irrigated. Many of the reductions were driven by regulation. Footprinting provides a means for individual decisions to be based on water use, similar to current practices in carbon footprinting, where younger generations use “the Carbon Game” to determine how many trees would need to be planted to offset carbon from a plane trip.

For more information contact Frank Reilly, LMI. [FReilly@lmi.org](mailto:FReilly@lmi.org)



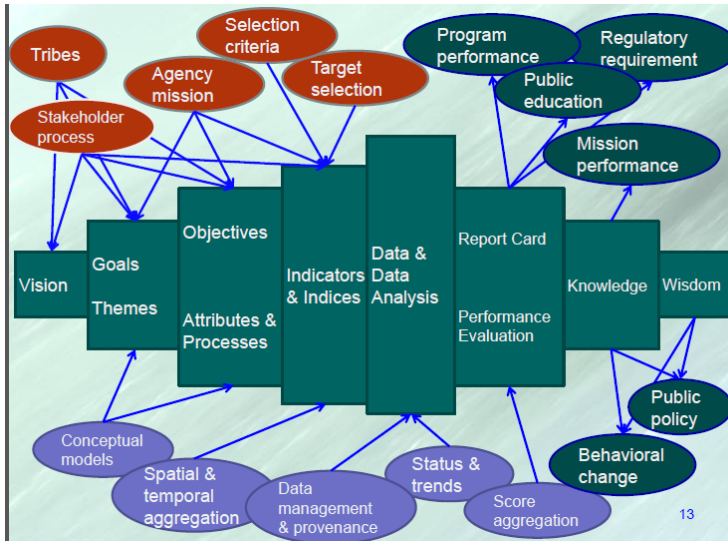
Rich Juricich, from the California Division of Water Resources, discussed the California's perspective on water resources management, how water sustainability concepts are addressed by the State, and how water sustainability is measured.

Juricich noted that California is the nation's most populous state, and has the highest water withdrawals, particularly for human use and irrigated agriculture, according to the USGS. California's precipitation falls mainly along the northwest coast and to the east in the Sierra Nevada mountains (as snowfall).

The largest population centers are to the south, in Los Angeles and San Diego, and in the middle of the state, in San Francisco. These population centers rely heavily on water that is "imported" from other regions of the state. California has several water systems to move water from north to south and from east to west – a "very engineered state" that has sufficient systems to move water from the top of the state all the way down to Mexico.

The increasing pressures on water supply from these factors have resulted in a concern that California's water system has lost its resilience. The State had determined an imperative to act on this concern in order to keep pace with changes such as population growth and movement; shifts to permanent crops; increasing flood risks; the declines in the San Joaquin Delta and other watershed; impaired water bodies; climate change impacts on water systems; aging water infrastructure and flood systems and challenges to these systems due to legal remedies and regulatory protections; and growing economic and societal consequences of declining water reliability and degraded quality of surface and ground water supplies.

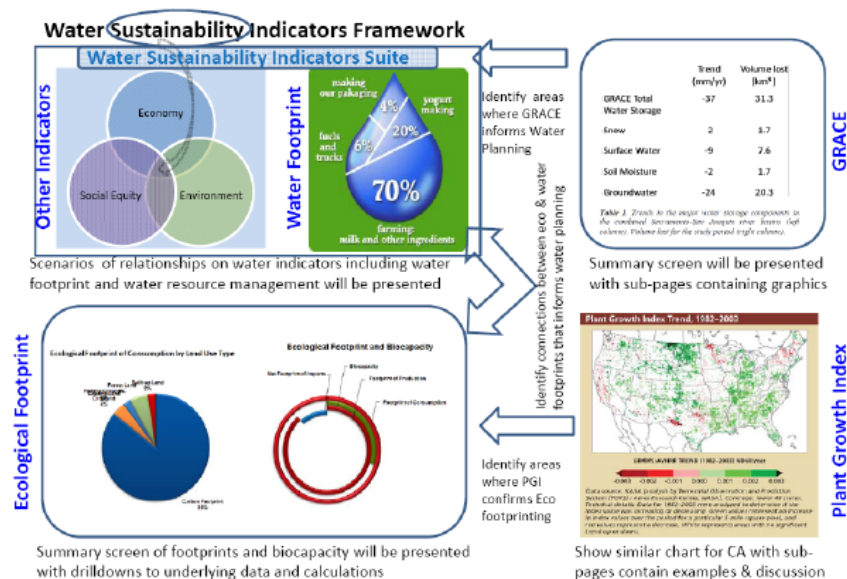
As a result, the State refocused the California Water Plan as the State's strategic water planning document – a blueprint for integrated water management and sustainability. The California Water Plan considers both "foundational actions for sustainable water uses (such as using water efficiency, protecting water quality, and expanding environmental stewardship) and initiatives to ensure reliability of water supplies (implementing integrated regional water management and improving statewide water and flood management systems) to support the overall vision for sustainability in the state. California's vision for sustainability includes public health, safety, and quality of life; vitality, productivity, and economic growth; and maintenance of a healthy ecosystem and cultural heritage.



The California Water Plan has faced a recurring question: “How can we ascertain that resource management strategies and objectives are providing sustainable water uses and reliable supplies for the State and its regions?” California began by defining water sustainability as “the dynamic state of water use and supply that meets today’s needs without compromising the long-term capacity of the natural and human aspects of the water system to meet the needs of future generations.”

Currently, the State is working on the 5-year Water Plan update for 2013 in order to help monitor progress to meeting water sustainability objectives through the development and application of an analysis framework (shown in the figure).

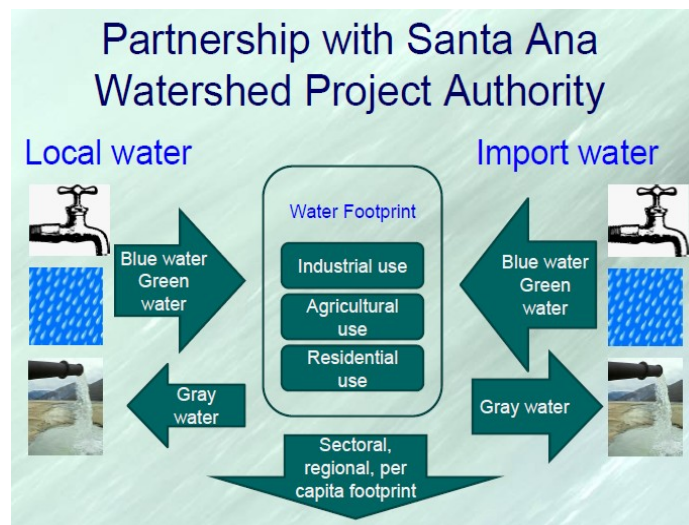
The State used different approaches to determining whether water sustainability objectives were being met. One project conducted by Shilling et al (2010) produced a report card for the Sacramento River Watershed in which measureable objectives were identified for each of the goals, and conditions, trends, and confidence levels were identified for each objective.



Another project, funded jointly by CA DWR, US Environmental Protection Agency's Advance Monitoring Initiative, and UC Davis, brought together several networks and incidences (e.g. plant growth index, ecological index) into a Water Sustainability Indicators Framework. This project

produces a water footprint at both a regional and state scale, and includes a decision support tool as a Global Earth Observation System of Systems (GEOSS) project.

In determining water sustainability for the state, California has considered approaches such as the use of “water footprint” calculations as an index of water use and impacts. California has also considered types of water for different uses. Juricich provided an example from agriculture, in which “green water” was identified as the precipitation-derived moisture in soil that provides the minimal evapotranspiration needs of plants; “blue water” was identified as the applied water (irrigation) to provide additional evapotranspiration needs of plants; and “grey water” was identified as the polluted runoff going to other waters within the assimilative capacity needed to bring pollutants down to an ecologically-tolerable level.



When water footprinting is applied to a specific watershed (such as the Santa Ana Watershed), that footprint can be seen as being comprised of many parts, including the water for goods, food production and consumption, commercial and industrial activity, energy production, and other uses. The Santa Ana Watershed Project Authority is evaluating the blue and green water additions and grey water discharges associated with both local and imported water to determine the footprint for that watershed, and integrate the single watershed footprint information into sectorial, regional, or per capita footprint analyses.

In closing, Juricich identified a few key considerations when applying the water footprint to water sustainability. Sustainability planning required systems thinking; a holistic approach; awareness of time horizons, scales, and trajectories; management of risk and uncertainty; improved data and tools; discovery of common ground for solutions; and continuous education.

The information from the California Water Plan has been provided on the website (<http://www.waterplan.water.ca.gov>), with links provided to “drill down” to specific approaches and analyses.

## **Community Participation in Federal Water Related Environmental Programs**

Moderator: R. Warren Flint, Ph.D., Five E's Unlimited, Napa, CA

There are a growing number of community watershed planning materials becoming available now. Thus, many communities are now more aware of where their water comes from and demanding that strategies be enacted to protect these water sources and their related environments. Traditional planning and management of communities and watersheds has been performed by local planners with minimal public participation, little process transparency, and often in isolation. Usually the public has been involved in these traditional planning processes through surveys and public hearings that allow minimal input. Decision-makers are now, however, increasingly becoming aware of the need for all-inclusive public engagement from the beginning of project design to commitment toward strategic watershed actions. Unfortunately most communities are still on their own in developing a project design for achieving their goals and objectives regarding management and improvement of their particular watershed. The common thread through this panel session will be the description of different tools that can be utilized by the public in their community-based efforts at developing watershed planning and management initiatives.

## **The Walkable Watershed - a stewardship case study in Richmond VA**

Miranda Maupin and Cheryl Little, Skeo Solutions, Charlottesville, VA

Skeo Solutions works on projects that fall into real-life situations focused upon “urban waters” – in urban, suburban/exurb and towns. Skeo has developed a program looking at connecting urban waters revitalization with broader community revitalization, especially for low income, underserved communities of color. The focus of the initiative is how these communities can benefit from water bodies. The work is guided by water sustainability criteria that provide guiding principles for Skeo regarding assistance on equitable development in the watershed context. This initiative is intended to invest in environmental restoration, infrastructure improvements, environmental education and community well-being.

What a is walkable watershed? It is the flow of water and flow of people promoting healthy waters that can lead to healthy communities. This initiative focused upon the Bellemeade neighborhood which is underserved, low income, and has a legacy of industrial land-use. The community is characterized by a lack of sidewalks and parks with no amenities and is bisected by an urban stream that has been neglected and drains into the James River. The concept promoted in this project was Watershed + Schoolshed.



- The City of Richmond is developing a Stormwater Master Plan to improve water quality, mitigate flooding and reduce stream bank erosion.
- The school district is developing a new elementary school adjacent to the creek – potential to be a community center and revitalizing force

All the kids go to same school and could walk to school within 15 minutes, but all are bused because no place to walk. Therefore the school kids do not have an appreciation of the environment in which they live and where they go to school.

So Skeo conducted a community goals and existing conditions analysis whose objectives were:

- Slow, infiltrate and clean rain water.
- Improve pedestrian routes to the community center and new school.
- Connect the neighborhood to the creek, the regional trail and the James River.
- Create outdoor education opportunities.
- Develop a sense of community centered around the new school and the watershed.

The workshop produced a shared vision, set of strategies and concept plan to improve watershed and neighborhood health in Bellemeade. A combined community workshop to create a watershed concept plan, along with capital improvement designs for improving infrastructure that promoted a more psychologically healthy position for community members and provided them with identity and a sense of community, that was supported by opportunities to get outdoors and appreciate their local environment.

The project faced typical urban water flow challenges including, eroded banks, pollution, and flooding. Streets had no formal curb and gutter, which resulted in ponding. The community working session brought together students, residents, non-profits and agencies to identify strategies for improving the watershed and walkability in the neighborhood. Walking the watershed together allowed agency and non-profit representatives to see the issues and start talking about solutions. 5th grade class was very actively involved in the process. They mapped out their priority (preferred) walking routes, attributes they looked for in the community setting, and what they would like to see on those routes and in watershed. Building on student priorities, the concept plan outlines 3 major green connections to the school and community center. The community research found that Planted streetscapes can be used to slow and



clean stormwater and provide a pleasant walking route to school. •Green streetscapes can provide multiple benefits – traffic calming, pedestrian safety and landscaping. The results were presented to city council, other decision-makers. As an outcome of this initiative

- All school sidewalks were funded
- Strategies were included in City's Stormwater Master Plan

- The project leveraged additional private funding to form coalition
- Pro bono park concept plan was developed
- Sparked local non-profit and volunteer activities

Lessons Learned from the project included the following:

- Bring a mix of stakeholders to the table
- Think beyond the project scale to a watershed-wide strategy
- Connect multiple benefits (walking, learning and water quality improvement)
- Leverage multiple funding sources
- Generate fun and inspiration

More information is available at:

[http://www.skeo.com/index.php/outcomes/bellemeade\\_walkable\\_watershed\\_pilot](http://www.skeo.com/index.php/outcomes/bellemeade_walkable_watershed_pilot)

## **The Bureau of Land Management's Public Involvement in NEPA**

Kerry Rodgers, Planning & NEPA Branch, Bureau of Land Management (BLM), Washington DC

The U.S. Department of the Interior, Bureau of Land Management

- Manages the National System of Public Lands -245+ million acres, primarily in 12 Western states
- Administers 700 million acres of sub-surface mineral estate across the U.S.
- In order to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations, a "multiple-use" mission



BLM develops resource management plans (RMPs) in an interdisciplinary planning process and uses the NEPA analysis to involve the public regarding land use planning and project-level decisions. This process is employed by BLM to manage activities such as recreation, livestock grazing, energy production, and mineral development, and conserves natural, historic, and cultural resources on public lands.

BLM presents opportunities for public participation in its planning and management processes through the NEPA process. Focus areas for this participation include:

- Public Involvement
- Cooperation
- Coordination
- Consultation
- Collaboration

NEPA regulations provide for public involvement at several stages:

- Scoping
- Public comment period on the Draft Environmental Impact Statement (EIS)
- Public meeting/hearing
- Agency response to comments in the Final EIS
- Comments on the Final EIS



The Scoping activities are an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. These apply to internal and external activities, as well as extending to alternatives development.

The NEPA process also emphasizes cooperation among governments and public and private organizations. As a lead agency, BLM invites

eligible Federal, State, local, and tribal agencies to serve as “cooperating agencies” for development of any EIS. •BLM also works with other partners. For example, the U.S. Environmental Protection Agency (EPA) conducts Clean Air Act “section 309” reviews. Other means of involvement include coordination with governments, through the BLM planning and NEPA processes; consultation through formal efforts to obtain another agency’s advice or opinion on the Endangered Species Act, the National Historic Preservation Act, Government-to-Government issues, Tribal consultation, and collaboration that is solution-driven, with varying formality.

BLM has developed a new e-Planning process that allows planning within BLM to be viewed with home computers and in libraries. BLM employees have been trained on documents development for this e-Planning process through systems piloted in Nevada. The e-Planning process is available for public user training through training sessions in videos and web-based trainings on the NEPA process. This is a way the public can learn how NEPA works and how can get involved.

BLM, has created *A Desk Guide to Cooperating Agency Relationships and Coordination with Intergovernmental Partners* (2012),

[http://www.blm.gov/wo/st/en/info/nepa/cooperating\\_agencies.html](http://www.blm.gov/wo/st/en/info/nepa/cooperating_agencies.html)

**Social Media - Community Participation Tool:** Marianna Grossman, Sustainable Silicon Valley (SSV), Palo Alto, CA

What is Social Media?

Social media is a tool for generating interaction with a variety of stake holders. Used well, you can greatly expand your outreach and involvement of new audiences. Social Media allows you, as an organization, to have a two way conversation with your customers, vendors, competitors and peers, using web-based technologies. Social Media can help your organization. It helps you spread the word about your company to those you do not know or cannot reach; through those you do know and can reach.

Different Social Media technologies include:

- Facebook
- Twitter
- LinkedIn
- EcoCloud™
- SSV site

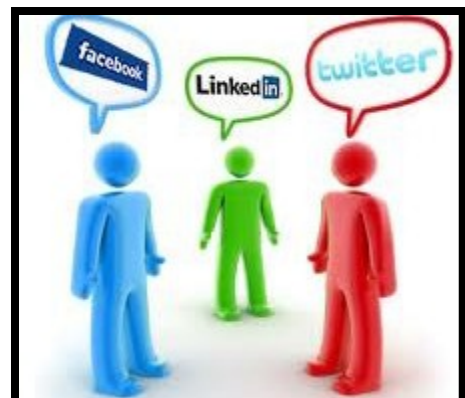
How can Facebook help your enterprise/agency?

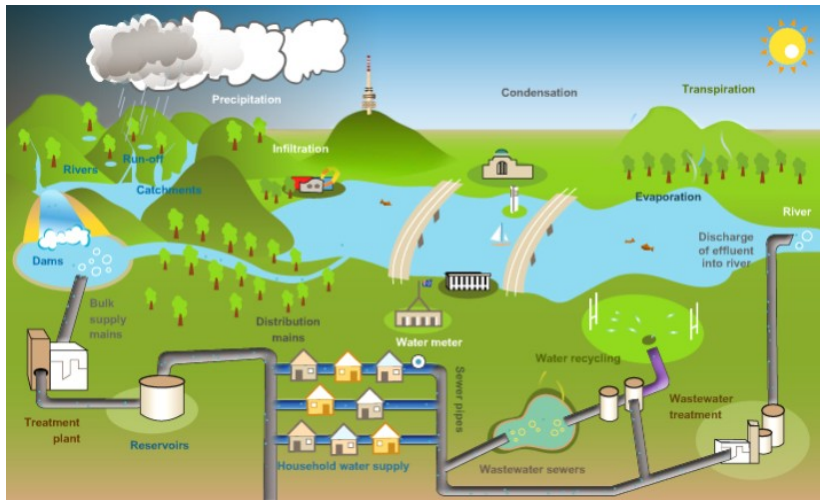
- Directly reach your customers
- Learn your customer's preferences through 'Likes' and 'Comments'
- Ask your market audience a question or conduct a poll to understand their needs better
- Answer specific questions or concerns directly using direct messages and groups
- Use existing loyal customers as brand ambassadors as they spread information about your company for you

How can Twitter help your Enterprise?

- Share and receive short quick messages with your market audience frequently
- Stay updated on latest news and information associated with your business
- Follow peers to see what your competitors are tweeting about and vice versa
- Promote events to peers and target market to encourage attendance
- Search for content related to your business using a "hashtag" #name

LinkedIn Groups can help in marketing through Social Media:





- Interact with individuals/ companies sharing a common interest through discussions or for crowd-sourcing purposes.
- Others learn about your employees and the organization while also getting to know about others within the group, who may be your competitors/peers
- To view an individual's educational background, professional experience, for recruiting and networking opportunities for your organization

EcoCloud™ Innovation Web Platform provides a section of cyberspace for:

- Major Focus Areas
- Information – articles, case studies, resources
- Tools - New Tools Reviews
- Social Media – Blogs, Working Groups, Forums

EcoCloud Examples:

- Silicon Valley Water Awards - 8 months; 15 Agencies/30 people
- CII High Tech Water Task Force - 4 months; 8 Agencies/8 people

You can measure your Social Media effects. SSV uses Klout, a social media measuring tool, which analyzes our social media efforts and evaluates effectiveness. Access Klout at [www.klout.com](http://www.klout.com). The Klout score increases as more individuals engage on SSV's Facebook and Twitter pages.

- This tool analyzes activity on Facebook and Twitter and generates a score, out of 100.
- Based on several factors, Klout assesses our success in reaching our audience, amplifying our message and the influence level of our current network.

The ultimate desired action Social Media marketing is to have individuals 'Like' our Facebook page and 'Follow' our Twitter page. This means they are interested in our information and want to subscribe to receive it every day. Engagement also involves going a step further, through 'Likes', 'Comments' and 'Shares' on our posts on Facebook and 'Retweets' and 'Mentions' on our tweets on Twitter

Sustainable Silicon Valley (SSV) invites all SWRR participants to join the EcoCloud site (free) and to use it for outreach for your own projects.

- a) we are working on creating "nodes" in specific regions of US and outside of US, in the meantime, input from all areas is welcome
- b) Sustainable Silicon Valley team members will help you get set up on EcoCloud, if you would like, or you can start your own group, contribute blogs and announce events.
- c) Companies or agencies can become paying partners of Sustainable Silicon Valley so that they can have a virtual "booth" in the EcoCloud marketplace to share commercial information about your enterprise or projects. (Contributions of whitepapers or other information is free.)
- d) Please contribute solutions that can scale to have impact on planetary sustainability for the SSV/NASA collaboration: the Showcase of Solutions for Planetary Sustainability (launch on Aug. 23, 2012. Main Showcase on May 23, 2013. Contributions from Sept to Dec 2012). Email to: [showcase@sustainablesv.org](mailto:showcase@sustainablesv.org) or [mgrossman@sustainablesv.org](mailto:mgrossman@sustainablesv.org)

Social Media marketing can help your organization make a bigger impact than traditional marketing. .More engagement allows you to understand who your customers are, their needs, your competitors and your overall market presence. .Measuring Social Media efforts helps evaluate your engagement and fine tune your methods for better results. EcoCloud can help share your message to a multi-stakeholder group

For more information see <http://www.sustainablesv.org/>

### **Panel Discussion: what does each organization do to achieve what they perceive as most effective public participation?**

SKEO: how do you create public participation that not only draws policy wonks and professionals? A: There's a lot of energy in communities that needs a forum to capture. By creating a public gathering or event so people can come with raw ideas and have professional help educate them about issues. Lawyers, engineers, agency representatives should all be part of process for implementing sustainability. You should also think about resisters, not just supporters. Get resisters in the process early and get them to become champions.

SUSTAINABLE SILICON VALLEY: part of a successful consultation process includes inviting a lot of companies, have them talk about thoughts and issues, and connect this dialogue to the planning process. Outreach to businesses, not just residents. Consider the role of business in vision and leadership. Discussing wasting less water and energy make companies uncomfortable and often gets politicized or the discussion leaves climate change off the table, and avoids transformational change, just trying to be a little less bad. When we started talking about climate change and taking a stand, people were thrilled to talk about it in a comfortable space where people could participate.

BLM has about 10K employees with diverse interests including federal oil and gas commissions. Five federal agencies are involved with new NEPA analysis process that is important not just in DC but for staff in field offices. For change management BLM must decide how to get message out on new policy and support implementation, provide tools, talking points, guidance, technical

materials. If conflicts or uncertainty on tools occurs, ensure people who created new policy can be available to clarify. Many steps have evolved from one-size fits all solutions.

For private companies, a 2nd party contractor does NEPA analysis and BLM directs analysis and lays out responsibilities. For land use plans and projects best management practices (BMPs) are employed. If a company has a technology or practice to mitigate impacts, it is always welcome. The NEPA process is concern about green washing interpretations for its activities. When a company announces a process, BLM is concerned with regulation. When mitigation is applied as result of process, the NEPA procedure is designed to incorporate extensive contribution from community, science, stakeholders. This eventually turns into more acceptance for best practices. BLM views the company as a collaborator. Within BLM, people are trying to share best management practices which include oil companies sharing BMPS and mitigation practices. NEPA provides a way for private sector to develop BMPs.



## **Open discussion of what is next for SWRR in support of sustainability programs**

David Berry, moderator

Warren Flint opened up the discussion with mention of several ideas on which the roundtable might work, including:

- An update of example indicators, including footprints, to better get at tracking what it takes to truly achieve sustainability
- Consideration of what might come next in concept after the "walkable watersheds" effort presented by SKEO, including the linkage between Smart Growth and clean water, and water use and energy
- Assessment of the different applications of water footprinting across the country
- A comparison of the frameworks for sustainability indicators
- Promotion of watershed sustainability indices
- Development of a how-to, step-by-step handbook for communities that may need help with the process of establishing a sustainability planning framework

Bob Wilkinson suggested that the roundtable also might be a good forum for highlighting the multiple benefits of best management practices, while Rich Juricich confirmed that California

has successfully used the roundtable as a sounding board in development of that state's water sustainability indicators. Ed Miller added that few groups had the roundtable's diverse profile.

Rhonda suggested that there might be a good opportunity to take advantage of the good roundtable profile by disseminating a special message on the gap between policy and regulation, and the relationship between professional and volunteer work, with a view to bolstering the work others must do in these times of tough budgets. Rich suggested that the roundtable involve public relations experts in this effort.

Cat Schreier, Rich and others discussed upcoming SWRR meetings and the possibilities of holding them in concert with other events, like the AWRA annual meeting in Jacksonville, Florida or an upcoming meeting of the Environmental and Water Resources Institute of the American Society of Civil Engineers. Rich also mentioned his intention to organize a water sustainability session for next year's conference at EWRI. He invited SWRR participants to submit abstracts. Glenn Shively of the Economic Research Service mentioned work in the global arena that SWRR might want to track or in which SWRR might become involved. The Organization for Economic Cooperation and Development is pushing an agenda of indicators development in its reports.

David Berry thanked the participants at the Water Roundtable meeting. He recognized that everyone was busy and yet chose to participate out of interest in the information shared and a willingness to collaborate. He called for ideas for SWRR activity asking people to suggest ideas they are interested in, would collaborate on, test out prior to a formal launch or fund others in doing. Over the years ideas find their way into panels on SWRR meetings, chapters of a SWRR report or special papers. SWRR can get studies done at low cost by grad schools that participate with SWRR. There are many avenues the roundtable can contribute.

David then said one of the Roundtable's most significant contributions is to provide a venue for presenting ideas and getting feedback to vet them. We had such an opportunity in the final presentation of the May SWRR meeting: to hear and respond to the Alliance for Water Stewardship's International Water Stewardship Standard.

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## The Alliance for Water Stewardship's *International Water Stewardship*

**Standard:** Edwin Pinero, Chief Sustainability Officer, Veolia Water North America



Ed Pinero explained presented a summary of the first draft of the Alliance for Water Stewardship's *International Water Stewardship Standard* and offered the published summary for inclusion in the SWRR meeting proceedings:

The world's water users, from agriculture and industry to cities and citizens, recognize the acute need to more sustainably manage the water resources on which they depend. In parts of the world, water scarcity is threatening the social, environmental and economic health.

Decision-making processes around water-related policy are leaving millions without access to their human right to clean water and sanitation. At the same time, the viability of business operations and economic activity is threatened. Shareholders, governments and consumers are increasingly demanding that companies use natural resources in ways that are environmentally and socially sustainable. Water users are also realizing that improving water quality and reducing water consumption can result in significant savings and increased profits.

The AWS International Water Stewardship Standard (the Standard) is designed to be an international, ISEAL-compliant<sup>1</sup>, standard that defines a set of water stewardship steps, principles, criteria, and indicators for how water should be stewarded at a site and watershed level in a way that is environmentally, socially, and economically sustainable. The Standard is intended to provide water stewards with an approach for evaluating the existing processes and

performances within their sites (or facilities) and watersheds, and ensuring that responsible water stewardship actions are in place.

### Structure of the Draft AWS Standard

The Standard is organized around four principles (which denote the broad, overarching areas and intent of water stewardship), criteria (more detailed actions), indicators (specific measures), and targets (specific outcomes by indicator) which, when combined, are designed to mitigate the negative impacts and magnify the positive impacts of water stewardship at the site and watershed levels. These impacts are ultimately evaluated along social, environmental and economic lines.



Furthermore, the Standard is structured as a matrix with the four core principles being crossed over with various steps. The steps are generally designed to reflect a plan-do-check-act cycle, thus allowing for integration into existing site-level management systems (e.g., ISO 14001).

The first draft AWS Standard is designed around a series of steps:

1. Make a leadership commitment
2. Measure the site's water use
3. Measure the use of water in the defined area of influence
4. Measure the current status of water in the defined area of influence
5. Measure the impacts and risks of the site's water use in the defined area of influence
6. Measure and manage the site's indirect water use

7. Develop plans for rare incidents
8. Develop and internally disseminate a water robust stewardship plan or policy
9. Remain in legal compliance and respect water rights.
10. Improve your water impacts at the site and beyond within the defined area of influence
11. Develop and maintain the necessary capacity to undertake water stewardship
12. Disclose your water stewardship plans, actions and results

The Standard has “core requirements” that must be met to become AWS Certified, but also recognizes two additional levels (or tiers) of water stewardship: AWS Gold Certified and AWS Platinum Certified (Figure 2). Currently, criteria are separated into core criteria (all of which must be met to achieve “AWS Certified” status), and bonus credits which reflect the increased range of actions, more challenging actions, and/or higher levels of performance.

Figure 4: Proposed AWS Certification Levels

Level	Meaning	Degree of Effort <sup>2</sup>		
		Site	Watershed	Supply Chain
Platinum Certified	Water stewards are at the cutting edge of stewardship.	X	X	X
Gold Certified	Water stewards are going above a base level to meet additional criteria to become strong leaders.	X	X	X
Certified	Water stewards are meeting a rigorous base level of criteria and are responsible water stewards.	X	X	x

<sup>1</sup> Compliant with the ISEAL Alliance Code of Good Practice for Setting Social and Environmental Standards. P005 - Public Version 5.01 – April, 2010

<sup>2</sup> Note: The size of the X in the figure indicates the relative amount of effort.

The Standard is designed to be able to be implemented by all sites, in any region of the planet, and within any sector. While the AWS is exploring the possibility of group certification for very small sites, the Standard is designed to be universally applicable. The Standard applies to all forms of water, including salt water and forms of solid water (e.g., glaciers). The Standard is designed to be implemented at the site level and outside the site (within the watershed) with a defined “area of influence” (Figure 3). The size of this area of influence is determined through a combination of factors and will be discussed further throughout the coming months.

The first draft of the AWS International Water Stewardship Standard was being developed through a multi-stakeholder process called the global Water Roundtable. The Water Roundtable is open to all stakeholders and includes a 15 member group called the International Standard Development Committee (ISDC) with representatives from three stakeholder groups (businesses and water service providers, civil society and public sector agencies) across eight regions (Africa, Asia Pacific, Central and Western Asia, Europe, Latin America and the Caribbean, North America, Northern Asia, and South Asia). Launched in 2010, the Water Roundtable publicly solicited ISDC members who were then put in place in June 2011. Since

that time, the ISDC has worked both over the phone and via three meetings to pull together the draft AWS Standard and the accompanying Guidance Document.

For more details on the process employed in the development of the Standard, refer to the AWS Water Roundtable Process document.

## **The Four Principles of Water Stewardship**

Principle 1 - Water Governance: *Water Stewards shall strive to achieve equitable and transparent water governance for all water users within the defined area of influence.* The water governance principle addresses how water is governed and managed, both internally within a site, and externally within a watershed, and includes aspects of access, rights, policy and claims. It is heavily linked to the notions of responsibility and accountability.

Principle 2 - Water Balance: *Water Stewards shall strive to achieve and maintain a sustainable water balance, and help to ensure adequate availability for all users at all times within the defined area of influence.* The water balance principle addresses the amount and timing of water use, including whether the volumes withdrawn, consumed, and returned at the site and in the basin are sustainable relative to renewable supplies.

Principle 3 - Water Quality: *Water Stewards shall contribute to the maintenance of good water quality status in terms of chemical, physical and biological characteristics to maintain ecosystems and ensure adequate water quality for all users within the defined area of influence.* The water quality principle addresses the physical, chemical and biological properties of water, including whether water quality at the site and within the basin are within acceptable local norms.

Principle 4 - Important Water Areas: *Water Stewards shall identify Important Water Areas at their sites and within their defined area of influence and shall strive to protect, manage and restore such areas as necessary.* The Important Water Areas principle addresses the spatial aspects of water, at the site and within the basin, and addresses the land forms that are a linked component of water systems, whether for cultural purposes or ecosystem services.

## **Next Steps**

The AWS, via the Water Roundtable, is committed to an equitable, open and transparent standard-setting process, following the ISEAL Code of Good Practice for Setting Social and Environmental Standards, and involving stakeholder interests from many different countries and from all parts of the supply chain.

Nicole Tanner of WWF and Sarah Davidson of The Nature Conservancy were present at the SWRR meeting with Ed Pinero and they led participants in a breakout session to respond to the draft standard. For more information, please visit: <http://allianceforwaterstewardship.org/> or contact, Adrian Sym, Executive Director, Alliance for Water Stewardship: [adrian@allianceforwaterstewardship.org](mailto:adrian@allianceforwaterstewardship.org) or Alexis Morgan, Global Water Roundtable Coordinator, Alliance for Water Stewardship: [alexis@allianceforwaterstewardship.org](mailto:alexis@allianceforwaterstewardship.org)

## **Summary of Stakeholder Discussion: Sustainable Water Resources Roundtable**

The Alliance for Water Stewardship made a summary of the useful feedback they received from the breakout session at the SWRR meeting and this is presented here.

### **Area of Influence**

It was suggested that the determination of a site's Area of Influence may need to be a separate step. One option could be to allow the Area of Influence to vary depending on the step of the Standard.

### **Certification Levels**

As currently drafted, some criteria only require one indicator per category. This may be too lenient for some levels of certification. For platinum-level certification, stewardship should be addressed holistically. Support was expressed for having various certification levels to recognize water stewards who have difficulty meeting the highest level of certification.

Certification levels could be organized on a points-based structure. Another option could be to have certification level determined by the number of indicators met.

The level of certification achieved by an implementer will likely be determined by the cost of certification and implementation. Higher levels of certification may cost more for sites to implement, although implementation could result in long-term savings.

### **Supply Chain**

Groups discussed whether and how the Standard should address the supply chain. Some participants felt that the supply chain should be included in the draft Standard. Other participants felt that supply chain inclusion should vary by industry—where there are significant supply chain impacts, they should be included, but where the impacts are minimal addressing the supply chain could result in unnecessary effort and expense.

### **Emerging Indicators**

The Standard represents an opportunity to address emerging indicators, such as pharmaceuticals or other materials that are potentially harmful but are not currently tested for or regulated. One option could be to require sites to disclose materials introduced into water to the receiving water treatment plant so the plant can determine if they can treat for it. Ideally, this disclosure would include the time these materials were introduced to the water.

### **“Promoters” of the Standard**

Groups discussed the role of potential “promoters” of the Standard—entities such as watershed organizations which would encourage uptake of the Standard. It was suggested that another

term should be used; options suggested included “Influencer” and “Champion.” This group may include watershed organizations, governmental authorities, or businesses.

## Definitions

Definitions in the standard should be as clear as possible, and opportunities for interpretation of the definitions should be minimized. One term that should be clarified is “water use,” for example, is stormwater counted as “water use”?

## Other Suggestions

- The Standard should be kept as simple as possible.
- Examples and tools should be provided to assist implementers in meeting each of the criteria. Clear guidance is needed, although flexibility may be needed for the Standard to be implementable in varying contexts.
- The NEPA process of avoiding, minimizing, and mitigating impacts should be viewed as a potential model for organizing steps within the principles.
- Land use planning could be addressed in the Standard. This could potentially include pre-site location decision making or site selection at higher levels of commitment.
- Credit should be given for involvement in existing platforms within a watershed. Currently, the draft standard could be interpreted to only give credit for starting new initiatives within a watershed.
- Benchmarking of data will be important for measuring progress.
- The Standard could have connections to energy.
- For 3.9, “exceed” should be added to “all relevant legal requirements.”
- Ecologue.com list serve was suggested as a resource.

## Stakeholder Questions for Consideration in the Standard

- How will the Standard be implemented in areas where data is not available? In water abundant areas, often much of the data is not captured. Data availability may be a problem both for implementing sites and for supply chains.
- How often will the Standard be reassessed?
- How will “at-risk” watersheds be targeted? Addressing at-risk watersheds could ensure that the Standard has maximum impact.
- Will Genetically Modified foods be addressed through the Standard?
- How much will it cost for an implementer to obtain certification? How much will the activities required to meet the Standard cost an implementer?
- How will indigenous groups be included? What is the appropriate inclusion of stakeholders?
- Will certification result in claims for specific sites, or specific products? Is it intended for business-to-business (B2B) or business-to-consumer (B2C) communication?
- Can a municipality be certified? Could large sites which have multiple functions, similar to a town, be certified?